MAR 8 1944

PAPER TRADE JOURNAL

MARCH 2, 1944

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WEBSTER

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Official U. S. Navy Photograph

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St. Lawrence Mills Controls Lake St. John Co.

Announcement At Annual Meeting of Lake St. John Power & Paper Co. States St. Lawrence Paper Mills Co. Holds 51 Per Cent of Its Stock— New Board of Directors Formed — Prospects of Future Discussed.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 28, 1944—At the annual meeting of the Lake-St. John Power and Paper Company it was announced that St. Lawrence Paper Mill Company had assumed control of the Company. This is being done by virtue of holdings by St. Lawrence Paper of the entire amount of the preferred stock of Lake St. John, 18,000 shares, and over 51% or 51,469 shares of the no par common out of 100,000 shares outstanding. As a result several changes were made in the board of directors, which is now identical with that of the St. Lawrence Paper. The new board of directors is as follows: A. K. Cameron, Arthur H. Campbell, Aubrey Davis, H. C. Flood, G. B. Foster, K.C., P. M. Fox, J. I. Rankin, R. W. Steele, N. A. Timmins, jr., and Arthur F. White.

At a subsequent meeting of directors, the following officers were appointed: Chairman of the board, A. K. Cameron; president, J. I. Rankin; vice-president and managing director, Arthur F. White; general Manager, P. M. Fox.

Discusses Prospects of St. Lawrence Co.

Arthur F. White, managing director of St. Lawrence Paper Mills, speaking at the annual meeting of that company here, told shareholders that intensification of operating difficulties must be expected this year. Costs, he said, were already sharply up from the early months of a year ago, repair materials were hard to obtain and pulpwood supply remained a major problem. The results in 1943, he thought, should be considered reasonably satisfactory. The company's shipments consisted of 112,381 tons of newsprint and 14,257 tons of sulphite and ground wood pulps, the output of newsprint being at the rate of 60% of capacity.

Cooperated to Fullest Extent

"Your company," he continued, "has co-operated to the fullest extent in the efforts put forth by the Canadian newsprint industry to meet the requirements of the American consumers, and, while in 1943 total shipments to that market were 2,550,000 tons as against a high point of 2,800,000 tons in 1942, nevertheless the 1939 figure of 2,200,000 tons was substantially exceeded. At the same time the industry has maintained a limited supply for England, Australia, New Zealand, India, Africa and the South American countries. It also made important contributions to the wartime emergency pulp requirements and these shipments to the United States have more than doubled the pre-war average."

Reasonably Prepared for Post-War Period

He added that the company was reasonably well prepared to meet the post-war period, but as practically its entire output was for the export market, all would depend on the conditions of international trade, particularly in respect of exchange and tariffs as they would then apply.

Vining Back With Newsprint Association

Charles Vining, president of the Newsprint Association of Canada since 1934, has resumed his functions with the Association, after an absence of two years on government service, and Paul Kellogg, who has acted as president in Mr. Vining's absence, has been appointed to the new position of general manager.

Mr. Vining was loaned to the Canadian Government by the Newsprint Association in 1941 and served for some months as assistant to the chairman of Wartime Prices and Trade Board at the inception of price control. In May, 1942 he was appointed Newsprint Administrator but was transferred from this to make a report to the Government on Canadian publicity in the United States. The report led to the establishment of the Wartime Information Board in September, 1942, with Mr. Vining as chairman. In 1943 ill-health compelled Mr. Vining to take a period of recuperation from which he has recently returned to Montreal.

Paul Kellogg, the newly-appointed General Manager of the Association, is head of Stevenson & Kellogg, Ltd., a Montreal firm of management engineers. He has been connected with newsprint affairs since 1936 and has had wide experience in industrial engineering.

Warns Industry is Facing Pulpwood Crisis

War Activities Committee of Pulpwood Consuming Industries Stresses Critical Supply Situation—State Announces More Bids For Pulpwood Cutting—WPB Makes Pulp Adjustment—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 28, 1944—Despite an upswing in domestic pulpwood receipts by the mills in the last half of 1943, the industry is facing a crisis this year unless pulpwood production can be increased substantially, the war activities committee of the pulpwood consuming industries advised the Victory Pulpwood Committee of South Wood county, Wisconsin, last week.

Expanded military requirements for paper and other pulpwoods products, together with the extremely low state of pulpwood inventories, were said to be responsible for the critical outlook.

"Although domestic pulpwood receipts in 1943 attained the minimum goal of 13,000,000 cords set by the War Production Board, consumption of pulpwood exceeded receipts and inventories fell to a new low," the committee said.

Last year 15,000,000 cords of pulpwood were consumed, whereas only 14,300,000 cords, including imports, were delivered to the mills.

"We are looking to the local victory pulpwood committees in some 1,400 pulpwood producing areas in 27 states to meet the War Production Board's challenge to produce a minimum 14,000,000 cords of domestic pulpwood in 1944," the committee said.

The State Timber Marketing Committee, Madison, Wis., has announced additional bids for pulpwood and timber cuttings in various forestry tracts, including:

Marked timber in a tract in Chequemegon National Forest, Wisconsin, estimated at 300 cords of jack pine pulpwood, 5 cords Norway pine pulpwood, 5 cords white pine pulpwood, 80 MBM of Jack pine, 25 MBM of Norway pine. Bids were received February 21 by the forest supervisor at Park Falls, Wisconsin.

Marked timber, estimated at 700 cords of 100 inch unpeeled balsam fir pulpwood and 180 cords of 100 inch unpeeled balsam fir pulpwood and 180 cords of 100 inch unpeeled spruce pulpwood. Bids were to be received by February 25 by the forest supervisor at Ironwood, Mich.

Market timber on about 270 acres on a tract in Nicolet National forest in the Peshtigo River watershed, Wisconsin, estimated at 600 cords of 100 inch of unpeeled aspen bolts and 250 cords of 100 inch unpeeled balsam fir bolts, sealed bids to be submitted to the forest supervisor at Rhinelander, Wis., up to and including March 10, 1944.

WPB Makes Pulp Adjustment

The Wisconsin River Paper Company of Plover, Wis., has received an adjustment of pulp allocation from the War Production Board to enable it to meet its existing contracts, it was announced last week at the office of United States Senator Robert M. LaFollette at Washington, D. C.

A prior reduction in the allocation of pulp, it was reported, had caused the company to tell WPB about the threatened curtailment of operation.

Senator LaFollette's office said it was informed that two steps are being taken by WPB to help various paper mills which may not be able to meet their contracts because of lack of pulp and which may thus be faced with possible partial shutdowns:

1. The orders are farmed out to a mill with a surplus of pulp and the latter fills the orders.
2. Attempts to have such mills make other types of paper products from available material and thus fill out the work week.

Safety Meeting Scheduled for March 30

The third of a series of safety meetings for employees of paper mills and other industries at Neenah and Menasha, Wis., will be held March 30, it was decided on Thursday of last week at a meeting of the Twin Cities Safety Council at the Valley Inn, Neenah. The chamber of commerce, vocational schools and the safety council sponsor these meetings.

E. A. Page of Kimberly-Clark Corporation, Neenah, and H. H. Aderhold of the Marathon Paper Mills, Menasha, are co-chairmen of the monthly meetings. Francis Rooney of the George Banta Publishing Company, Menasha, is chairman of the safety council, and Carl Christensen, director of Neenah Vocational school, is secretary.

At the council's meeting, the 29 members present saw a series of sound slide films prepared by the National Safety Council on handling materials safely. The group decided to continue the idea of showing films on industrial safety.

Employees Vote for U.M.W. Union

Employees of Riverside Paper Corporation, Appleton, Wis., voted last Thursday, 66 to 60, to accept District 50, United Mine Workers of America as their bargaining agency. The election was held at the mill under auspices of the National Labor Relations Board.

F. R. Watson and R. J. Croteau represented the company as supervisors, and August Schwanke and Walter Centner represented the union during the election. An organizational campaign had been conducted at the plant since October 1, 1943, by Howard McKillip and John Bryant, representing District 50, with the former directing the campaign.

Mr. Schwanke will act as temporary chairman until the new union elects officers.

Women Workers Awarded Production Bars

Four hundred and twenty-one women employes of Kimberly-Clark Corporation's Lakeview mill at Neenah, Wis., were awarded red plastic bars last week, to be worn under the regulation Women in Production Service pins. Their applications for advancement in rank were approved by the board of control, which is composed of 10 feminine workers

at the plant. The board received a total of 531 applications. Those not approved will be considered again in 30 days.

The bar means that the women have maintained perfect attendance records for 30 days, have perfect safety records, and are participating in war bond purchases. The 421 Wips represent 42 percent of the feminine personnel. They are now Wips, senior grade, and map apply for the next rating, junior lieutenant, within 60 days.

The Kotex department personnel had the largest number of girls advanced in rank, as 110 qualified, and the Kleenex department second, with 105.

Announcement was made last week of the appointment of John R. Kimberly, vice president of Kimberly-Clark Corporation, Neenah, Wis., as chairman of the finance committee for Wendell Willkie's presidential campaign in Wisconsin.

Appoints Paper Committees

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 28, 1944—The office of Industry Advisory Commitees, War Production Board, announces the formation of a Paper Industry Waste Paper Advisory Committee. Rex W. Hovey, WPB Paper Division, has been appointed the Government Presiding Officer. Members of the committee are:

Alfred W. Arenander, Jr., West Virginia Pulp and Paper Company, New York, N. Y.; Wayne Crotty, Bryant Paper Company, Kalamazoo, Mich.; C. K. Ferguson, Watervliet Paper Company, Watervliet, Mich.; C. W. Gallup, New York and Pennsylvania Company, Inc., New York, N. Y.; W. H. Ketra, Mead Corporation, Chillicothe, Ohio; Duncan MacMahon, Champion Paper and Fibre Company, Hamilton, Ohio; George W. Munson, Fitchburg Paper Company, Fitchburg, Mass.; Morgan Smith, Crocker-Burbank Company, Fitchburg, Mass.; Dwight Stocker, Michigan Paper Company, Plainwell, Mich.; and Earle Weaver, International Paper Company, New York, N. Y.

The first meeting of the commitee was held February 21, 1944.

The Office of Industry Advisory Committees, War Production Board, announces the formation of the Waxed Paper Industry Advisory Committee. Charles E. Snow, Paper Division, has been appointed the Government Presiding Officer. Members of this committee are:

John J. Cahill, Crystal Tissue Company, Middletown, Ohio; Lee Croy, Menasha Products Company, Menasha, Wis.; Allen B. Engle, Pacific Waxed Paper Company, Seattle, Wash.; L. L. Jacobs, Pollock Paper and Box Company, Dallas, Texas; P. J. Massey, H. P. Smith Paper Company, Chicago, Ill.; A. P. Mitchell, Riegel Paper Corporation, New York, N. Y.; C. E. O'Connor, Jr., Berst-Forster-Dixfield Company, New York, N. Y.; R. H. Rausch, Automatic Paper Machinery Company, Inc., Hoboken, N. J.; H. K. Snyder, Central Waxed Paper Company, Chicago, Ill.; V. H. Wilshire, the Specialty Papers Company, Dayton, Ohio, and Karl R. Zimmer, Zimmer Paper Products, Indianapolis, Ind.

The first meeting of the committee was held February 19, 1944.

The Office of Industry Advisory Commitees, War Production Board, announces formation of the Condensers Tissue Manufacturers Industry Advisory Committee. Harold E. Wright, Paper Division, has been appointed Government Presiding Officer. The membership of this committee consists of:

H. H. Griswold, C. H. Dexter & Sons, Windsor Locks, Conn.; C. A. Pifer, Crocker-Burbank & Co., Fitchburg, Mass.; M. Peter Schweitzer, Peter J. Schweitzer Company, Inc., Newark, N. J.; C. N. Stevens, Stevens Paper Mill, Inc., Windsor, Conn.; and W. F. Tatum, Smith Paper Company, Lee, Mass.

The first meeting of the committee was held on February 18, 1944.

The Office of Industry Advisory Committees announces formation of the Envelope Industry Advisory Committee. Leonard F. Smith, Paper Division, has been appointed Government Presiding Officer. The membership of this committee consists of:

Harry F. Affelder, the Wolf Envelope Company, Cleveland, Ohio; David Goldwasser, Atlanta Envelope Company, Atlanta, Ga.; George W. Hall, Coast Envelope and Leather Products Company, Los Angeles, Cal.; E. V. Johnson, United States Envelope Company, Springfield, Mass.; H. S. Jones, Commercial Envelope Company, Baltimore, Md.; G. F. Keefer, Samuel Cupples Envelope Company, Inc., Brooklyn, N. Y.; W. R. Lake, Mail-Well Envelope Company, Portland, Ore.; B. H. Miller, Heco Envelope Co., Chicago, Ill.; Richard D. Rheutan, Union Envelope Company, Inc., Richmond Va.; and Harold Smith, Western Envelope Manufacturing Company, Kansas City, Mo.

The first meeting of the committee was held on February 18, 1944.

Pulpwood for Wisconsin Mills

Wisconsin mills will no doubt come through with enough pulpwood to meet their 1944 requirements, based on the amount of activity in the northern woods area and in upper Michigan. A survey made recently by Lewis C. French of the Milwaukee Journal indicates not only that the large operators are meeting with success in logging on a big scale, but that many small operators and thousands of individuals have gone back to the woods to make what they consider lush money on the basis of prices now being paid.

The tremendous demand for lumber is carrying pulpwood production along with it, and other factors are contributing such as the vigorous publicity appeals for war cooperation, the modification of selective service regulations with respect to those deferred as farmers and essential workers, and the more favorable housing and feeding conditions and higher pay for those in the logging camps. Even the weather has been a strong contributing influence, since there has been a continued absence of the deep snows that make the work slow, more difficult and more expensive.

Workers' checks are assuming attractive proportions, and the fastest loggers are earning as much or more than they could in the competitive war plants.

The Rhinelander Paper Company, Rhinelander, Wis., has big crews at work in its northern Wisconsin tracts. In Michigan, the William Bonifas Lumber Company, a subsidiary of the Kimberly-Clark Corporation, Neenah, Wis., and the Mosinee Paper Mills Company of Mosinee, Wis., are doing large scale operations. The Marathon Paper Mills Company, Rothschild, Wis., also is taking out extensive timber not only for pulpwood but also for a sawmill it operates at Ironwood, Mich.

Paper Supply Becomes Tighter in Midwest

Heavy Demand For All Major Items Encourages Belief That Establishment of End-Use May Be Next Step To Avoid Rationing — V-Mail Aids the Salvage Drive — Salesmen Install New Officers.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 28, 1944—Chicago, in general, is finally becoming convinced of the seriousness of the paper shortage in this area. While the publicity given to the salvage drives probably had a lot to do with it, it is believed that the change of heart really came from business users of cartons and containers. Retailers, in particular, have been told that while the supply of civilian goods may be expected to increase it may be impossible to make shipments of such merchandise because no protective cartons nor containers will be available.

Chicago paper trade executives expected WPB to further curb the use of containers in the form of amendments and revision to existing WPB orders on fiber shipping containers and container board. The general market, locally, is becoming increasingly perturbed over the pulp shortage arising from more and more Government demands. Local paper firms are far behind in orders, have long passed the allocation stage and are trying desperately to get paper in any shape or form. Envelope manufacturers are taking from one to three months to fill ordinary envelope requests.

The sulphite market is very tight while newsprints and groundwoods in general saw no relief in sight in the near future. Books and covers have joined the ranks of the "scarcity clan" with a vengeance while the wrapping paper and container markets are becoming increasingly convinced that the establishment of "end use" is the next step if rationing of paper and paper products is to be avoided.

Dixie Cup Sales Lists Personnel Changes

Ralph McClure has recently been appointed a sales manager of the Dixie Cup Company to cover the Illinois territory and eight surrounding states. He will work with F. T. Krein, general salesmanager of the western division with headquarters in Chicago. Mr. McClure was transferred from the Oklahoma City territory. John Alden, formerly of the north central region, will now cover Ohio, Michigan, Indiana, Kentucky and eastern Tennessee, and will also make his headquarters at the Chicago office. The changes represent a sales program wherein Dixie Cup has created two separate sales divisions out of one division formerly known as the North and South Central divisions.

V-Mail Aids Salvage Drive

Army officials in this area report that they turn over to a Joliet, Illinois, paper mill, an average of five tons of letters for pulping purposes every two days. It is estimated that a million letters make five tons of the valued pulp. The letters are coming from widespread usage of "V" mail, the letters pulped in view of Army representatives and, prior to that, retained at the V mail station until assurances have been received that the letters have reached their destination and are readable. Twenty midwestern states supply V-mail to the station here. The Navy, with a smaller enlistment, stated that it contributes about one ton of paper every two days from its own V-mail station.

Pupils of Chicago's 550 public and parochial schools collected 1,248,124 pounds of waste paper in the first week of the five weeks contest for the $1000 in prizes donated by the Chicago Newspaper Publishers Association—the figure being an increase of more than 400 tons from that of the preceding week. The contest will continue until March 18.

Meanwhile, the Chicago Waste Paper Salvage Committee announced an overall area collection for the four weeks ending February 19 as 175,000 tons of paper. The monthly goal is 205,000 tons.

Coarse Paper Merchants In New York

As an indication of its increasing interest in the program of the National Paper Trade Association and allied groups, Chicago coarse paper firms sent a delegation of Chicago Paper Association members to the eastern meetings. The group included Leo Altholz, Inlander Steindler Paper Company; S. S. Weil; William S. Knox, president of the Association and J. S. Druth and William Chukerman, treasurer and vice president respectively.

Salesmen To Install Officers

The western division of the Salesmens Association of the Paper Industry, having canceled its Monday, February 21, meeting in order that all "stragglers" might get back from New York, now plans to formerly install its new officers on February 28 when the group gathers at the Hotel Sherman for its regular noon roundup. Already installed as national president of the SAPEYES, Burt Fisher, popular sales executive of the Bergstrom Paper Company, will see that the newcomers to office are comfortably installed. Forrest D. Patterson, Flambeau Paper Company, will be inducted into office as western vice president while Edward J. Edwards of the Howard Paper Company, will become the new assistant vice president, western division. It is expected that "Pat" Patterson will also announce the full committee personnel on Monday but up to this writing he has been unable to complete the list.

Another special feature is planned for the February 28 meeting when Mr. Patterson will preside over the dedication of the Service Flag of the Salesmens Association of the Paper Industry. Twenty-five stars are on the Flag, thirteen of them representing members of the Western division.

New Salesmen Member

Harry Zeigler, Chicago sales representative of the S. D. Warren Company, is the newest members of the Western division of the Salesmens Association of the Paper Industry, according to the report of that group's membership committee.

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Diatomaceous Silica in Paper

By R. G. Quinn[1] and C. J. O'Neil[2]

Diatomaceous silica, also known as diatomaceous earth, diatomite, infusorial earth and kieselguhr, is an amorphous silica formed from the residues of aquatic plants known as diatoms. These are a kind of microscopic plant life which grew in great profusion in past geological periods and which are abundant even today. This type of silica is composed almost entirely of the fossil remains of the diatoms. Under high magnification, these fossils are revealed as unbelievably thin, transparent valves or shells of diverse shapes with ornate and symmetrical markings. The average diatom is so small that some thousands or more must be laid end to end to equal one inch. Great quantities of these diatoms settled at the bottom of the pre-historic Pacific Ocean. The sea floor has since risen and diatomaceous silica is found in some coastal areas in stratified deposite sometimes over 1000 feet thick, such as the Celite deposit near Lompoc, Cal.

Properties of Interest to the Paper Maker

Valuable and characteristic properties of diatomaceous silica are chemical inertness, great bulk, minute porosity, diverse shapes, extreme fineness, high absorption and, in special processed grades, very high brightness. It is readily wetted by water and disperses quickly.

One of the early industrial applications for diatomaceous silica was in filtration work. In filtration, a coating of diatomaceous silica powder is formed upon a fine mesh wire retaining screen by simply pumping into the body of the filter a suspension of diatomaceus silica in the liquid involved. The diatomaceous silica is removed upon the screen as an even, porous coating, usually referred to as the cake. This cake, due to the varied sizes and shapes of the microscopic diatoms, contains countless minute flow channels through it. In fact, these channels make up almost 90% of the volume of the cake. Their cross section is so small that they trap and retain the solid suspended impurity particles from the liquid but their number is so great that the filter cake can operate for a long time before it becomes clogged by the removed impurities. For example, in the brewing industry, the removal of impurities and turbidity is accomplished by pressure filtration with diatomaceous silica. Sugar, oils and many chemicals are clarified because of the ability of diatomaceous particles to form lattice structures capable of entraining fine particles and yet providing interstitial channels for the passage of liquids at high rates of flow. In paper, a similar function is performed. The diatomaceous silica in the sheet provides additional paths for water to get to the surfaces of the sheet. This may occur on the wire and particularly at the suction boxes. The removal of water beyond that which is free draining is enhanced because the presence of the diatomaceous silica voids accelerate the passage of water.

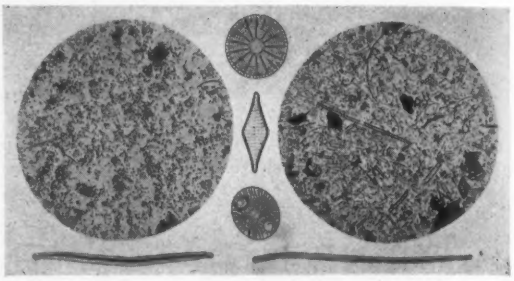

FIG. 2

The Large Circles Shown Above Are Photomicrographs (200 X Magnification) of Two Commercial Grades of Diatomaceous Silica. Celite No. 321, on the Left, Has High Bulking Value; Celite No. 340, on the Right, Has Exceptional Brightness Characteristics. Some Individual Diatoms at High Magnification Are also Shown.

In cylinder machine operation, diatomaceous silica functions as a drainage aid at the couch. This action reduces the tendency to disrupt formation of the sheet at the nip between the felt and the mould because of more rapid water movement through the sheet. The higher surface friction of diatomaceous silica stocks also serves to reduce slippage at this point. Acceleration of water removal and higher surface friction are of importance also at the presses where crushing and checking are to be avoided.

Suspensions of diatomaceous silica in water have infinitely high drainage rates on the conventional freeness scale. As a filler, diatomaceous silica is unique as even at abnormally high percentages in the furnish it will not slow down the drainage characteristics of the stock. On very slow stocks an increase in freeness is sometimes attained with diatomaceous silica. Whether this result is due to improved porosity or to the tendency to prevent early flocculation of fiber, or both, is a point difficult to determine. The prevention of flocculation is, however, of consequence in the initial stages of the formation of the sheet itself. By separating the fibers, the stock is offered to the forming wire more evenly. The mat

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[2] Staff Manager, Filtration and Filler Department, Johns-Manville Sales Corporation, 22 East 40th street, New York, N. Y.

FIG. 1

Part of the Mills and Quarries at Johns-Manville's Celite Deposit at Lompos, Cal.

STOP MOLD BEFORE IT STARTS!

DOWICIDE

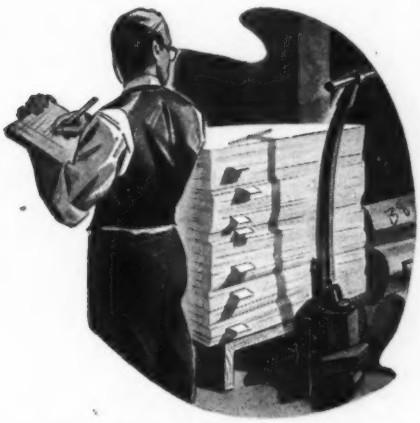
GERMICIDES AND FUNGICIDES

Additional Dow products for the Paper Industry include: Methocel, Ethocel, Caustic Soda and many other chemicals.

March 2, 1944

It may seem a contradiction to try to stop an attack before it starts—but that is precisely what the Dowicides do in combating the costly ravages of mold, decay and termites.

The 17 related Dowicide products are the results of many years' research. Their effectiveness has been proven many times over through successful use in the paper, paint, leather, lumber, and textile fields. Added to these products, Dowicides prevent mold and bacterial growth even under the most severe conditions.



Though the Dowicides are comparatively new products, the paper industry has already learned their value in the many operations where high humidity is present, and mold becomes a costly hazard. Stock, as it comes off the lapping machine, retains a high moisture content, and storage is an open invitation to mold attack. Dowicide G applied as the stock emerges from the machine, defeats mold and protects the pulp quality. Pulp that is held in stock chests is subject to mold growth and souring. Here, the Dowicides not only prevent the mold attack, but also preserve the fibre structure of the pulp. Mold-resistant paper, for uses where moisture will be in contact with the finished paper, can also be produced with the Dowicides. Additional details on many other applications are available on request.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York • Boston • Washington • Philadelphia • Cleveland
Detroit • Chicago • St. Louis • Houston • San Francisco
Los Angeles • Seattle

Dow announces the opening of a Detroit office to serve this important industrial area.

Dow

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

initially deposited is less likely to have pockets of high and low resistance to drainage, so that additional stock is picked up or distributed more evenly. These factors combine to improve the smoothness of the sheet.

The non-adhering nature of diatomaceous silica combined with its absorptivity and enormous specific surface are useful in prevention of sticking troubles on the paper machine. One pound of diatomaceous silica may have from 25,000 to 200,000 square feet of surface. There is, therefore, covering power of a high magnitude available to surround particles in the stock. The absorptive character of the material is reflected in its high capacity to absorb oils. This capacity is much above that of other common paper fillers. The irregular particle shapes appear to have a bearing on the retention of diatomaceous silica in the sheet. Above normal retention is experienced in comparison with other pigments and fillers under equivalent conditions. In some instances the coating and absorptive properties combine to improve retention of other ingredients in the furnish. Because of the chemical inertness, diatomaceous silica does not interfere with sizing or coloring operations.

Diatomaceous silica does not cake-up or shrink on drying. This characteristic, in addition to the lower moisture content of the web coming from the presses, serves to speed up the drying operation. This is particularly the case in the production of heavy sheets from slow stocks where there is danger of formation of an outer skin of high density and low capillarity. Diaomaceous silica maintains a path for the water to penetrate through such films. It also serves to reduce the possibility of their formation because of more rapid transfer of moisture from the inner strata to the surface.

In the finished paper or board, the bulking due to the low density of diatomaceous silica is most pronounced. Higher caliper sheets per unit weight are obtained. The physical properties, such as mullen and tensile are not appreciably altered at low diatomaceous silica content but strength values generally may be expected to be lowered as the percentage is increased. It would not be expected to be otherwise since this filler does not have any binding qualities, but on the contrary, is non-adhering. It follows also that diatomaceous silica papers have lower stiffness. In some instances improvements in physical properties of the sheet have been reported. These are more likly to be secondary effects due to improved formation, or elimination of crushing at the couches or press.

The surface friction of a diatomaceous silica paper is usually higher, so that slippage between sheets, or in feeding to printing presses, is reduced. Ink receptivity is more rapid because of the high absorptivity of diatomaceous silica fillers.

Mineral fillers generally may be expected to have an abrasive effect. In the case of diatomaceous silica this effect is not usually noticeable or of a magnitude sufficient to alter the average life of machine clothing. When employed in high percentages as a filler, it is sometimes desirable to apply corrective measures to counteract abrasiveness in converting equipment.

Some types of modified diatomaceous silicas have high brightness. These types find application as brightening pigments themselves and also as extenders for other fillers commonly employed to improve opacity.

Applications in Paper Making

One of the earlier and best known uses of diatomaceous silica in paper making is for pitch control. In this application the porous, absorbent, minute particles of diatomaceous silica added when the pitch particles are small, absorb or coat the pitch, overcoming its stickiness and preventing the formation of troublesome large pitch lumps. A very small percentage of diatomaceous silica is needed to accomplish this, usually the same weight as the pitch content. The retention is high, hence most of the diatomaceous silica and pitch go into the sheet instead of building up in the white water, making this method of pitch control very effective and economical.

Another usage based on the same principles and one which has become extremely important lately due to the pulp and waste paper shortage, is the use of diatomaceous silica to make asphalt laminated scrap available as usable fiber. Here again the application depends upon the coating of the asphalt (or other laminants) with diatomaceous silica. The laminated scrap in the form of clippings, trimmings, or waste paper, is processed in a regular beater using water heated sufficiently to facilitate fiberization (usually between 140° F and 200° F.). Preferably the scrap be preshredded or otherwise broken up into small pieces. The diatomaceous silica is added intermittently while the scrap is being furnished using a weight of diatomaceous silica equivalent to the weight of the asphalt or other laminant in the beater load. Under the softening effect of the hot water and the beating action, the scrap is disintegrated and the intermittently dispersed diatomaceous silica coats all particles of exposed asphalt. After mixing with regular non asphalt fiber, the stock is handled as usual through the jordans and on to the cylinder machine. The asphalt is still present in the sheet and will show up as spots of varying size in the final product. Since these particles are coated however, sticking to the machine parts or felts is avoided. The size of the individual asphalt specks in the final board is dependent entirely upon well known processing variables, including temperature of the water in the beater, the length of beating cycle, the amount of jordaning and screening.

Another advantageous use of diatomaceous silica which has been gaining popularity in the last few years is its use as a bulking agent in chip board, liner board and other cylinder machine products. Here a very low percentage, approximately 3% to 4% on the furnish, will often show marked effects on machine operation and on the final product. Added at the breaker beater with the furnish the diatomaceous silica dispersed in the sheet, while effecting improved formation, simultaneously facilitates the removal of water, thereby lowering the load on the driers by delivering a sheet of lower water content. This produces either faster machine operation, or steam saving, or both, depending on the objective. Final board surface is usually smoother and has good surface qualities for printing or adhesives. Increases of 10% in bulk and the same percentage in machine speed have been accomplished in certain mills on certain boards.

The same improved bulk can be accomplished with diatomaceous silica in virgin pulp sheets made on Fourdrinier machines. In this application from 3% to 10% of Celite on the pulp dry weight is the usual amount used. The final effect on bulk is dependent

We are with you SHELL

Reproduced from Shell Oil Company advertisement appearing in recent business magazines.

in paying tribute to WEST VIRGINIA'S 2 year non-stop production!

A deserved tribute to West Virginia Pulp and Paper Company management and men, machine and lubrication — not to forget the major part played by the ROSS Air System and the modern

ROSS PANEL HOOD

It is the longest hood on any paper machine in the world. Like all ROSS Hoods it is fireproof, acid resisting and unaffected by heat and moisture.

Just as Shell Lubrication is developed to solve specific operating problems, ROSS Hoods are designed to fit exact individual machine requirements. At West Virginia's famous Charleston mill, the huge ROSS Hood makes for better efficiency of the machine crew by maintaining comfortable atmospheric conditions, reducing heat required for ventilation and drying, insuring cleaner and more evenly dried paper — all without any interference with normal machine operation.

On more than 200 paper machines, ROSS Panel Hoods are "on the job" boosting production efficiency. Our Bulletin No. 17 will be gladly sent on request — no obligation.

ROSS SYSTEMS

J.O.ROSS ENGINEERING CORP.

350 MADISON AVE., New York, N. Y.

CHICAGO - 201 North Wells Street **DETROIT—12953 Greeley Avenue**

ROSS ENGINEERING OF CANADA, LTD., Dominion Square Building, Montreal

CONTROL OF AIR FOR MODERN INDUSTRY

upon whether or not other fillers are also in the sheet and many other factors, including machine speed, weight of sheet, and retention. An increase of 10% in bulk on sulphite bonds and mimeos has been accomplised. Such diverse furnishes as ground wood on one hand and bleached soda on the other have been appreciably bulked by diatomaceous silica. The intrinsic bulking capacity is an outstanding characteristic of diatomaceous silica. This is experienced particularly in mimeo sheets where improved ink absorption, both amount and speed have been noted.

The different available grades of diatomaceous silica allow a wide choice as regards brightness. The choice ranges from grades of around 65 GE-Institute brightness to special processed grades up to 95. Alone, these very high brightness grades can improve the brightness of some sheets. Used with HO_2 in recommended ratios the pigment cost is lowered for a given brightness. The more TiO_2 required for a specific job the higher is the potential saving in the total pigment cost. To obtain high opacity remarkably fine results are being achieved with mixtures of TiO_2 and lower brightness grades of diatomaceous silica. An example of such an application is airmail envelope paper.

In suggesting that diatomaceous silica can impart valuable characteristics to paper or in the process of manufacture, we are referring to commercially standardized grades such as Celite 340, Celite 321 and Celite 305.

It can be seen from the above that there is a wide application of diatomaceous silica in paper, both in improved processing and in the adjustment of sheet properties. The available standardized grades are fully described in current technical data sheets. It is suggested that paper men consider the qualities which diatomaceous silica has and judge whether or not at this time these materials can help them in their daily problems.

Makes Paper Bomb "Wheels"

A new synthetic resin which makes paper tough enough to withstand rain, mud and snow now permits the use of this non-essential material for the guards that protect heavy aerial bombs, replacing the metal "wheels" formerly used and saving two hundred million pounds of steel annually—enough to build 3600 tanks. This new development of the Resinous Products and Chemical Company of Philadelphia is a synthetic "ureaformaldehyde" resin known as Uformite and makes possible a paper wheel which is actually more shock-resistant, lighter and easier to handle than the metal bands.

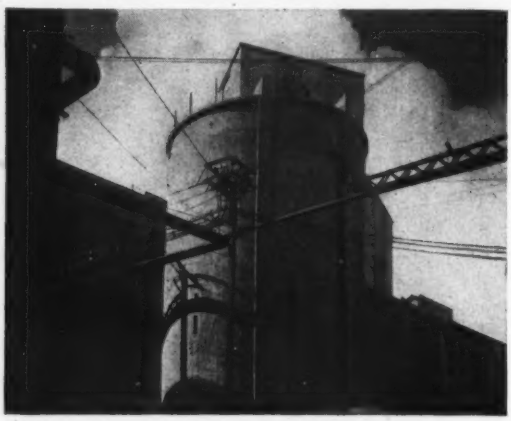
Before our block busters make their final plunge they must be brought to munition dumps, carried to the airfield and loaded aboard the plane, each step involving the moving of up to 1000 pounds of sudden death. To protect the two American lugs on the bomb and make it easier to transport, two wheel-like bands are placed on the bomb over the lug so that it can be rolled over rough ground with the minimum of effort and danger. Every bomb is protected by these bands from the time it leaves the factory until it is placed in the bomb bay of the plane.

The Alton Box Board Company, Alton, Ill., in cooperation with the ordnance division of the War Department perfected these paperboard protectors which are now mandatory for all bombs up to 1000 pounds in weight.

Completes Giant Resin Drier

The rapid growth in the use of synthetic resins for paper manufacturing and protective packaging as a tool of war places new emphasis on the recent development by Resinous Products and Chemical Company, at Philadelphia, Pa. of one of the world's largest resin spray driers. The new unit produces free-flowing powders out of liquid urea-formaldehyde resins. These powdered resins—used for improving wet-strength properties of paper and for weatherproofing fiber board and corrugated board—save on shipping costs, since they are light in weight and use lighter, less critical containers than the liquid types.

At the present time, urea formalydehyde resins are finding commercial application in the production of toweling, blue print, tag stocks, map and chart papers,



One of the World's Largest Resin Driers

bag and wrapping papers, glassine and greaseproof papers, tissue papers, manual and book papers and other miscellaneous types. These resins meet the three principal requirements of a beater size; they are infinitely water soluble, combine chemically or are physically absorbed by the pulp, and convert to an insoluble form in a limited time on the machine. In addition, the urea formaldehyde resins, as exemplified by uformite 466, are employed for impregnating or laminating with equally high effectiveness.

Resembling a huge "gas-holder" in shape and size, the vast capacity of this new resin-powdering unit, was dictated by ever-increasing uses for synthetic resins for the above applications, and as adhesives for assembling gliders, airplanes, torpedo boats, barracks and military truck bodies. Liquid resin, pumped to the top of the four-story high hot-air chamber, is converted into a fog by the action of a highspeed centrifugal wheel, falling to the floor as a fine powder. A revolving knife blade brushes the powder into ducts, then into collectors where air is removed and conveyors carry the powder over screens and into shipping drums.

Despite their ability to get top priorities, Resinous Products' engineers found they could complete the giant drier more quickly by employing salvaged and second-hand equipment. Coolers, conveyors and furnace came from an Idaho potato dehydration plant. A 200 h.p. motor came from a used-parts dealer in Pittsburgh, a large fan from an abandoned Canadian mine tunnel, and iron gratings and stairs from a dismantled Philadelphia Rapid Transit powerhouse.

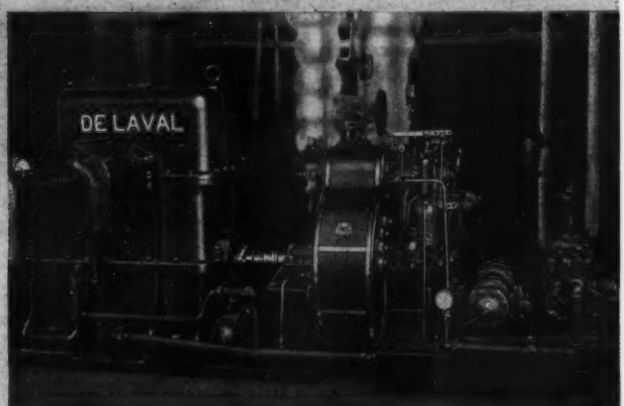
Eight worm gears, each to transmit 185 hp. from a 3760 r.p.m. turbine to drive a draft fan at 550 r.p.m.

FOR SMALL TURBINE DRIVES *specify* DE LAVAL WORM GEARS

The high efficiency and reliability of De Laval worm gears is especially valuable in continuous, 24-hour service. The efficiency approaches 97 per cent at some ratios and increases, rather than recedes, with use. Power is transmitted without vibration, chatter or shock. The only maintenance required is occasional inspection of the oil level in the casing.

The driven shaft can be extended to either right or left, or both, or either up or down, or both.

Ask for Booklet W-1130 on "Industrial Applications of Worm Gears"



Worm gear transmitting 225 hp. from 3900 r.p.m. turbine to drive a paper machine. A De Laval worm gear in similar service has been in continuous operation for more than 15 years.

DE LAVAL

WORM GEAR DIVISION

of the De Laval Steam Turbine Co., Trenton, N. J.

MANUFACTURERS OF TURBINES · STEAM, HYDRAULIC PUMPS · CENTRIFUGAL, PROPELLER, ROTARY DISPLACEMENT, MOTOR-MOUNTED, MIXED-FLOW, CLOGLESS, SELF-PRIMING CENTRIFUGAL BLOWERS and COMPRESSORS · GEARS · WORM, HELICAL and FLEXIBLE COUPLINGS

R. B. Roe Honored at Dinner

Ralph B. Roe, technical director of the Sorg Paper Company, Middletown, Ohio, was honored at a dinner given on February 14 at the Stockholm Restaurant, New York, for paper mill technicians, by Goesta Hall, member of the Swedish Trade Mission.

Mr. Hall, who represents Svenska Pappers-och Cellulosa Ingeniorsforeningen, the technical association of the Swedish pulp and paper industry, on the Swedish Trade Mission, presented Mr. Roe with a scroll and a vase of Swedish art glass. An illustration of the scroll and vase is shown herewith.

In his presentation remarks, Mr. Hall called attention to the chlorine consumption method published by Mr. Roe in 1924, and subsequently modified by Mr. Genberg and Mr. Johansson. The Johansson modification has been in extended use throughout the Swedish industry for several years, and because of the general application and use of the Roe Chlorine Number, the presentation was made.

The guests had an opportunity to taste "acquavita", a liquor manufactured from the sugars in sulphite waste liquor. Those present were also informed of the technical progress in the Swedish forest industries in recent years and steps taken to obtain the highest possible standards.

The following guests were present:—Carl Appelgren and F. C. Goodwill, St. Regis Paper Company, Deferiet, N. Y.; A. E. Bachman, Missisquoi Pulp and Paper Corporation, Sheldon Springs, Vt.; Mr. Barnett, Hercules Powder Company, Hopewell, Va.; John D. Bates, Price & Pierce Company, Ltd., Montreal, Canada; N. I. Bearse, Champion International Company, Lawrence, Mass.; M. G. Benson, Dill & Collins, Inc., Philadelphia, Pa.; J. A. Bicknell, S. D. Warren Company, Cumberland, Me.; Dr. Loy Bixler, Riegel Paper Corporation, Riegelsville, N. J.; G. J. Brabender, Marathon Paper Mills Company, Rothschild, Wis.; F. W. Brainerd, Scott Paper Company, Chester, Pa.; W. A. Brawn, Pejepscot Paper Company, Brunswick, Me.; Mark Bray and C. H. Chidester, Forest Products Laboratory, Madison, Wis.; W. E. Byron-Baker, New York & Pennsylvania Company, Lockhaven, Pa.; H. P. Carruth, Union Bag and Paper Corporation, New York; C. M. Connor, Glassine Paper Company, West Conshohocken, Pa.; Mr. Coyet, Stockholm, Sweden; F. R. Dufford, Paterson Parchment Paper Company, Bristol, Pa.; George C. Dunn and T. W. Dunn, Dunn Sulphite Paper Company, Port Huron, Mich.; I. N. Earle, Deerfield Glassine Company, Monroe Bridge, Mass.; Ivar Eckholm, National Aniline Company, New York; Bjorne Edstrom, Stockholm, Sweden; Lars Ekelund, Holmens Bruks Company, Sweden; Vance P. Edwardes, International Paper Company, Palmer, N. Y.; James Foote, Berst-Forester-Dixfield Company, Plattsburg, N. Y.; K. R. Goehegan, Aetna Paper Company, Dayton, Ohio; P. P. Gooding, Strathmore Paper Company, West Springfield, Mass.; H. H. Harrison, Crystal Tissue Company, Middletown, Ohio; Mr. Hedbring, Continental Paper Company, Bogota, N. J.; Bo Hoglund, Swedish

VASE AND SCROLL PRESENTED TO MR. ROE

RALPH B. ROE

GOESTA HALL

Trade Mission, Sweden; Helen U. Kiely, American Writing Paper Company, Holyoke, Mass.; M. F. Knack, River Raisin Paper Company, Monroe, Mich.; Dr. Otto Kress, Institute of Paper Chemistry, Appleton, Wis.; Mr. Lamb, River Raisin Paper Company, Monroe, Mich.; R. G. Macdonald, Technical Association of the Pulp and Paper Industry, New York; W. G. MacNaughton, Newsprint Service Bureau, New York; A. K. Nicholson, Hollingsworth & Vorse, East Walpole, Mass.; G. W. E. Nicholson, Union Bag and Paper Corporation, Savannah, Ga.; F. H. Osborne, G. H. Dexter & Sons, Inc., Windsor Locks, Conn.; Dr. John L. Parsons, Hammermill Paper Company, Erie, Pa.; D. D. Payne, duPont deNemours & Co., Arlington, N. J.; J. E. Plumstead, Jessup & Moore Paper Company, Philadelphia, Pa.; R. I. Wynne Roberts, Finch, Pruyn & Co., Inc., Glens Falls, N. Y.; R. B. Roe, Sorg Paper Company, Middletown, Ohio; Dr. John D. Rue, Hooker Electrochemical Company, Niagara Falls, N. Y.; Mr. Savage, Mead Company, Chillicothe, Ohio; Dr. John W. Shackleton, duPont deNemours & Co., Arlington, N. J.; A. L. Sherwood, Sutherland Paper Company, Kalamazoo, Mich.; George K. Spence, Castanea Paper Company, Johnsonburg, Pa.; A. J. Stamm, Forest Products Laboratory, Madison, Wis.; John Strange, John Strange Paper Company, Menasha, Wis.; George Teren, Consulting Engineer; Dr. Hilding Tornebohm, Swedish Trade Mission, Sweden; Dr. Traquair, Mead Company, Chillicothe, Ohio; Dr. D. D. Uong, Fitchburg Paper Company, Fitchburg, Mass.; George Wadleigh, West Virginia Pulp and Paper Company, New York; Sven Wahlstrom, Swedish Trade Mission, Sweden; A. Westerdahl, West Virginia Pulp and Paper Company, New York; Ralph A. Wilkins, Bird & Son, Inc., East Walpole, Mass.; and Mr. Zinkle, Container Corporation of America, Chicago, Ill.

Blake, Moffitt & Towne Changes

Announcement has been made by O. W. Meilke, general manager of Blake, Moffitt & Towne, of the appointment of D. A. Halgren to the position of sales manager, Wrapping Paper Department in the company's Seattle Division. Experienced in the field of wholesale selling, Mr. Halgren came to Blake, Moffit & Towne in 1930. Since that time he has covered the larger commercial and industrial accounts, specializing in the industrial uses of paper and cordage.

The appointment is actually the creation of a new position demanded by greatly increased business activity and detail resulting from expanded operations and growth in the Seattle area. All sales were formerly under the supervision of Frank A. Carson, who will now concentrate his efforts on the Printing Paper Department of which he is sales manager. In addition, he will continue to act in a supervisory capacity in all purchasing. Mr. Carson is a past president and honorary member of the Purchasing Agents Association of Washington and a member of the Seattle Chamber of Commerce.

S. R. Montague to Speak at Boston Dinner

BOSTON, Mass., February 28, 1944—Sydney R. Montague, an ex-Canadian mountie, is to be the speaker at the annual meeting and dinner of the Boston Paper Trade Association at the Algonquin Club March 15. His subject will be "Arctic Frontiers."

WPB to Allocate Mill Machinery

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Mar. 1, 1944—Manufacturers of paper and paper board mill machinery and fiber-box making equipment will be allocated certain amounts of controlled materials—steel, copper and aluminum—upon application to the War Production Board, members of the Containerboard and Fiber Box Industry Advisory Committee were advised by WPB officials at a recent meeting in Washington. The amount of materials which the Requirements Committee of the WPB has agreed to allocate for this purpose will approximate pre-war requirements, and probably equal the total received during 1942 and 1943, it was stated.

The materials will be distributed proportionately to those producers of mill equipment who have available facilities to manufacture additional civilian equipment of this type, according to Allan Hyer of the WPB Paper and Paperboard Divisions. He stated, however, that deliveries under AA-3 priorities might be slow because of continuing war orders. Any new equipment manufactured will be allocated to producers of container and fiber board who can increase their production, it was explained.

If any increase in U. S. paper production is possible, it should be confined to the production of additional container board, G. G. Otto, Director of the WPB Paperboard Division, stated. The demand for paper board suitable for making fiber containers is so great, Mr. Otto emphasized, that the industry should make every effort to increase production of that type of paper board.

Corrugated requirements for the second quarter of 1944 were estimated as about the same as for the first quarter by W. L. Davis of the Paperboard Division, who reported that estimated production would be approximately the same.

The Paperboard Division is studying "furnishes," the mixtures of the several materials from which paper is made, to ascertain what additional economies can be effected to save virgin pulp by reducing the richness of mixtures, he said.

Calculating Chain Drive Centers

In order to shorten the time required for calculating center distances and chain lengths of chain drives operating over cut-tooth wheels, Link-Belt Company has computed and published a series of tables which give very accurate results.

The number of teeth in small sprocket wheel of the drive is given in the upper right-hand corner on the right-hand page of each spread of pages of this book No. 1991. The number of teeth in the large wheel appears at the top of each of the tables.

The body of table gives exact center distances for a chain of one-inch pitch and of the length listed in pitches in the first column. Center distance for any other pitch of chain may be obtained by multiplying the centers in table by the pitch.

A copy of this 20-page book No. 1991 may be had by writing direct to Link-Belt Company, Chicago, Indianapolis, Philadelphia, or other office of the company.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending February 26, 1944

STOCKS

	High	Low	Last
A. P. W.	2⅝	2⅝	2⅝
Armstrong Cork Co.	37½	37½	37½
Celotex Corp.	11⅜	11⅜	11⅜
Celotex Corp., pf.	17¾	17½	17⅝
Certain-Teed Products Corp.	5⅞	5¾	5¾
Certain-Teed Products Corp., pf.	61	59½	59½
Champion Paper & Fibre Co.	27⅞	26	26⅞
Champion Paper & Fibre Co., pf.	111⅞	111¼	111¼
Congoleum Nairn Co.	23⅝	22⅞	23⅛
Container Corp. of America	20½	20¼	20⅜
Continental-Diamond Fibre Co.	11⅞	11⅝	11⅞
Crown-Zellerbach Co.	16½	16	16½
Crown-Zellerbach Co., pf.	99¾	99⅛	99¾
Dixie Cup Co.	16⅞	16½	16⅞
Dixie Cup Co.—A	44⅞	44¼	44¾
Flintkote Co.	22¼	20	22
Flintkote Co., pf.	105¾	105⅛	105⅛
Robert Gair	3⅝	3¼	3⅝
Robert Gair, pf.	15⅞	14½	15⅛
International Paper Co.	14¾	13⅞	14¼
International Paper Co., pf.	69⅞	68¾	69½
Johns-Manville Corp.	88⅜	86¼	88⅜
Johns-Manville Corp., pf.	121⅜	121⅛	121⅜
Kimberly-Clark Corp.	32½	32½	32½
Mac Andrews & Forbes	26¾	26¾	26¾
Mac Andrews & Forbes, pf.	135	135	135
Masonite Corp.	40⅝	39⅛	40½
Mead Corp.	9	.8¾	9
Mead Corp., pf. A—6%	86	86	86
Mead Corp., pf. B—5½%	77½	75¾	77½
National Container Corp.	13¾	13⅛	13¼
Paraffine Companies, Inc.	45½	45½	45½
Paraffine Companies, Inc., pf.	104¾	104½	104¾
Rayonier, Inc.	13¼	12⅞	13¼
Rayonier, Inc., pf.	28⅞	28½	28½
Ruberoid Co.	28⅞	28	28¾
Scott Paper Co.	41¾	41⅝	41¾
Scott Paper Co., pf.	110	110	110
Sutherland Paper Co.	31½	31	31¼
Union Bag & Paper Corp.	10	9⅝	9¾
United Paperboard Co.	4½	4½	4½
U. S. Gypsum Co.	72½	70⅞	72½
U. S. Gypsum Co., pf.	176	176	176
West Virginia Pulp & Paper Co.	18¾	18⅛	18¾
West Virginia Pulp & Paper Co., pf.	105½	105	105⅛

BONDS

Abitibi Pulp & Paper Co., 5s '53	109	109	109
Celotex Corp. 3¾s '55	102⅜	102⅛	102⅜
Certain-Teed Products Corp. 5½s '48	101½	100½	101
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	108	107½	108
International Paper Co. 5s '47	104½	104⅛	104⅛
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending February 26, 1944

STOCKS

	High	Low	Last
Great Northern Paper Co.	....	....	....
Hummel-Ross Fibre Corp.	5	5	5
St. Regis Paper Co.	5⅜	4¼	5¼
St. Regis Paper Co., pf.	156½	152½	155⅛
Taggart Corp.	5¼	5¼	5¼

BONDS

American Writing Paper Co. 6s '61	101	101	101

Donnacona Earns $194,846

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 28, 1944—The financial statement of the Donnacona Paper Company for 1943 shows net profit for the year at $194,846, as compared with $105,837 in 1942. A marked strengthening of the balance sheet position is also revealed. Total of first mortgage bonds and notes was cut by $611,000, bank loans by $129,000, while aggregate of cash and government bonds rose from $187,000 to $452,000 and net working capital at $2,511,000 was higher by some $639,000. During the year a settlement of the notes due from the Hearst Companies was made on the basis of 50c in the dollar, U. S. funds, and after converting same into Canadian funds the company netted $351,147. The loss on realization of this item, which had been carried on the 1942 balance sheet as a deferred asset, was $319,224, and this was charged to the year's profits.

Operating profit at $1,514,083 compared with $1,323,562 for 1942 and set a new high level in the history of the company. After the various charges and provisions net profit worked out as shown above on the common shares. Reviewing the year President R. P. Kernan states that demand for all the company's products continued at a satisfactory level, but because of the lack of space for foreign shipments and because of government regulations imposed for the purpose of conserving wood for the industry as a whole the output of practically all products was lower than in the preceding year.

Abitibi May Pay in Full

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 28, 1944—Negotiations between the numerous committees and public officials continues in connection with the affairs of Abitibi Power and Paper Company, Ltd. The company is so important to the industrial life of Ontario and its financial ramifications so diversified that public officials, on the one hand, feel the necessity of invoking every legal and legislative power available in the interests of the general public, while on the other hand, holders of the various classes of securities seem inclined to exact every cent of compound interest to which they are legally entitled.

One of the latest moves on the part of the Ontario government was the introduction of a bill at the present session by Attorney-General Leslie E. Blackwell to amend the Abitibi Moratorium Act. The minister explained it was an extension of the previous act, the purpose of which was to prevent the Abitibi Power and Paper Company property from being "sold under the hammer."

"The result of the moratorium to date," the attorney-general said, "has been that instead of the bondholder getting only 36 cents on the dollar it now appears likely he will receive 100 cents."

Rayonier Reports for Nine Months

Rayonier, Inc., and Wholly Owned Subsidiaries report as follows: nine months to January 31: Net profit, $1,230,614, or 30 cents a common share, against $1,537,623, or 62 cents a common share, for similar period of previous year. Renegotiation has been completed with Government covering fiscal years ended April 30, 1942, and 1943, as result of which $259,700 after readjustment of income taxes is being refunded on war contracts.

Kimberly-Clark Earnings Larger

Despite substantially larger taxes, earnings of the Kimberly-Clark Corporation and its subsidiaries last

year exceeded those of 1942, according to the preliminary annual statement just announced. The net profit for the year ended December 31, 1943, after deductions of $4,000,000 for Federal taxes and $150,000 contingency reserve, was $2,301,754, equal to $3.49 a share of common stock. After Federal taxes of $2,840,000 and a similar provision for contingencies, the net profit for the previous year came to $2,185,443, or $3.25 a common share.

Hummel-Ross Fibre Nets $394,865

The Hummel-Ross Fibre Corporation reports as for 1943: Net profit, subject to renegotiation and after deducting $41,267 for post-war adjustments, was $394,865, equal to 90 cents a common share, against net profit in 1942 of $405,696, equal to 93 cents a common share. Taxes on income totaled $879,368 after deducting postwar refund credits of excess profits taxes of $71,260, while 1942 taxes were $654,735 after deducting $47,212 post-war refund credits of excess profits taxes.

Ernst Seidelmann Expands

Harry Winkler, managing director of Ernst Seidelmann, exporters and importers, Woolworth Building, New York, N. Y., who has been in the international business for forty-four years, is now entering upon an expansion program and announces the appointment of Albert Pfeifer, general merchandise manager. Mr. Pfeifer was formerly an official and general merchandise manager of Pfeifer Brothers, Little Rock, Ark. They have recently taken over additional space on the 43rd floor at the above address.

W. F. Howell Appointed Chairman

Wilbur F. Howell, secretary of the Robert Gair Company, Inc., New York, has been appointed chairman of the Long Island City Branch of the Civilian Defense Volunteer Office, located at 45-22 Greenpoint avenue, L. I. C., by Mrs. John Adikes, Queens County Chairman of C. D. V. O.

Maclaren Co. Earnings Off

The annual report of the MacLaren Power and Paper Company for the year ending November 30 last shows that the paper subsidiary had a net profit of $284,810 as compared with $638,358 in the previous year. The power subsidiary's net profit was $412,265, as compared with $359,528.

To Direct General Products Div.

Eli de Vries, President of Parsons & Whittemore, Inc., New York City, announces the appointment of Edwin C. Kenton, as director of their General Products Division. Mr. Kenton has been associated with the Foreign Economic Administration and will direct special products for export.

Bryant Paper Co. Reports $220,552

The Bryant Paper Company reports as for 1943: Net income, $220,552, equal after preferred dividend requirements to 38 cents a share on common, against 1942 net of $231,740, or 40 cents a common share; net sales, $6,280,213, against $6,151,843.

New Waterproof Gummed Label

The Mid-States Gummed Paper Company has just announced its new 1239-A Waterproof Label Paper. That this new product has high moisture and water resisting qualities is proved by the accompanying illustration, showing a 1239-A Label, immersed in a tank of water since July 12, 1943, and still securely adhering to the section of V-tape fiber board, although the fiber board is noticeably deteriorating.

Neither temperature extremes nor variations affect 1239-A, once it has been applied. It is not susceptible

NEW WATERPROOF LABEL PAPER

to mold growth either. It is affixed with as much ease as any other label, and adheres to many types of waterproof surfaces, such as metal, lacquers, molded products, coatings, etc. A solvent known as 1239-A solvent is used to moisten the 1239-A adhesive rather than water. You may address Mid-States for complete details and samples of 1239-A Waterproof Label Paper, at 2515 South Damen Avenue, Chicago, 8, Ill.

Feed Water Regulation

The Sixth Edition of the textbook, "Mechanical Feed Water Regulation for Boilers" by Professor E. P. Culver is now available. The booklet covers the principles of boiler feed water control, and describes mechanical equipment available to meet various operating conditions. Differential pressure control and feed pump control are also discussed and numerous illustrations, diagrams, and chart reproductions are included.

First published in 1938, the textbook has been popular with power plant engineers, operators, and engineering students. The current edition has been revised to keep its contents up-to-date.

The book is furnished free upon request to the Northern Equipment Company, 1945 Grove Drive, Erie, Pa.

Joins N. E. Paper Merchants Assn.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 28, 1944—The White River Paper Company, White River Junction, Vt., has been accepted as a member of the New England Paper Merchants Association.

Obituary

Winthrop Lakey Carter

Winthrop Lakey Carter, president of the Nashua Gummed and Coated Paper Company, Nashua, N. H., and active in the industrial and civic life of New England for more than twenty-five years, died suddenly February 22 at his home 326 Hammond street, Chestnut Hill, Brookline, Mass., after a brief illness. Mr. Carter was 59.

He was a director of Carter, Rice & Co. Corp., paper dealers of 273 Summer street, Boston, Mass., a firm founded by his father, a former president of the New England Council, election in 1935, serving one term trustee of the Massachusetts Horticultural Society, a member of the corporation of Northeastern University and a director of the Second National Bank of Boston.

He was born in West Newton, the son of James R. and Carrie Giles Carter, and was graduated from Yale in 1907. The same year he engaged in the manufacturing of paper and became president of the Nashua Gummed and Coated Paper Company of Nashua, N. H.

He established his legal residence in New Hampshire and maintained offices in Nashua and a farm home in nearby Hollis. He varied his career by excelling as an amateur photographer, horticulturist, philatelist and sportsman.

He was a member also of the industrial advisory committee of the Federal Reserve Bank of Boston and was an industry member of the regional War Labor Board for New England. In 1917 he was president of the New Hampshire Manufacturers' Association and in 1935 was elected president of the New England Council, serving one term.

Mr. Carter was a connoisseur of antiques and furnished his Hollis home with some of the best examples of early New England furnishings. He maintained an extensive apple orchard at Hollis and specialized in improving standard varieties.

He participated as a team member in curling matches at The Country Club and was an ardent horseman and golfer. He traveled extensively in Europe and South America in connection with his business and was a director of the Gummed Paper Company of Leicester, England.

In 1918 he was commissioned a lieutenant in the United States Naval Reserve and assigned to the Bureau of Supplies at Philadelphia.

He was a director of the Berwin Paper Corporation, Canadian Nashua Paper Company, Liberty Mutual Insurance Company, Mutual Boiler Insurance Company, Nashua Package Sealing Company, member and former president of the American Waxed Paper Association and held membership in the Yale Clubs of New York and Boston, Beacon Society, Alpha Delta Phi, Union Club of Boston, Nashua Country Club, American Club of London, Eng., and Elihu Club of Yale.

He was vice president of the American Paper and Pulp Association in 1931 and 1932 and a member of the Advisory Council and Executive Committee from 1924 to 1932.

He leaves his wife, the former Elizabeth Barton whom he married in 1909; and three children, Mrs. Katherine Carter Smith of Dallas, Tex.; Sydney H. Carter and Winthrop L. Carter Jr.; two brothers, Hubert L., and Capt. Eliot A. Carter, USA, and a sister, Mrs. Howard Giles.

More than 500 friends and business associates attended the funeral services. Commitment services were held at the Forest Hills Crematory.

Lawrence Wells Case

MANCHESTER, Conn., February 28, 1944—Lawrence Wells Case, 73, of Highland Park, president and treasurer of Case Brothers, Inc., local paper manufacturing firm, died February 16 following a brief illness.

A native of Manchester, Mr. Case attended schools here, later studying at Wilbraham Academy and Massachusetts Institute of Technology from which he was graduated. He entered the employ of the local firm, founded by his father and his uncle who were twin brothers, and rose steadily until he became president. He was a member of South Methodist Church and active in various organizations.

He leaves his wife, Mrs. Florence Reid Case; a daughter, Dorothy; a son, A. Wells Case in the USNR; and a sister, Mrs. Robert Dennison of Montclair, N. J.

Edwin A. Wright

Edwin A. Wright, 52, sales manager of the Orchard Paper Company, 3914 Union boulevard, St. Louis, Mo., died February 18 of heart disease at St. Luke's hospital after he was stricken at his home.

Mr. Wright formerly was sales manager of the Bemis Paper Bag Company, of St. Louis, the Union Paper Bag Company of New York and the Virginia-Carolina Chemical Company, Richmond, Va., and president of the Wright Bag Company, Brooklyn, N. Y. He had been president of the St. Louis Chamber of Commerce Sales Managers' Bureau since

GENERAL MANAGER WANTED

Converting plant (sanitary papers) wants general manager to take full charge of operations. Must know manufacturing and distributing thoroughly. Give full particulars in first letter covering these points:

(1) Knowledge of manufacturing toilet paper, towels and napkins.
(2) Knowledge of distribution, direct or through paper merchants.
(3) Knowledge of costs and cost analysis.
(4) Experience in directing operations.
(5) Experience in working with employees.
(6) Knowledge of army and navy requirements, specifications and personnel.
(7) Markets and territories you know well.
(8) Sections of country you are willing to live in.
(9) Minimum salary you will accept (salary of job is frozen).
(10) How soon will you be available.
(11) References which can be used if other qualifications are met.

Our employees know of this advertisement.

Address Box No. 44-130 care Paper Trade Journal. **M-2**

December and was active in the Advertising Club of St. Louis.

Surviving are the widow, the former Miss Jane Jolley, reached at St. Petersburg, Fla., where she was visiting when her husband died, and two daughters, Miss Edwina Ann Wright and Mrs. Fred H. Schleich, both of the home.

Funeral services were held at St. Ann's Catholic Church, 7532 Natural Bridge road, Normandy, with burial in Calvary Cemetery.

William E. Rice

William E. Rice, 75, a member of Potter, Rice Company, paper products, 275 Congress street, Boston, Mass., died February 26 at his home, 125 Park street, Brookline. He is a former resident of Cambridge and for many years has been active in the affairs of St. James Episcopal Church, Cambridge. Funeral services were held February 28 from the A. E. Long Memorial Chapel, 1979 Massachusetts avenue, Cambridge, with the Rev. E. M. Paddock of St. James' Church, officiating. Burial was at Waterside cemetery, Marblehead.

Post-War Flying Cargoes

That "flying freight cars" are not mere figments of a dreamer's imagination is demonstrated conclusively in a factual, down-to-earth 48-page booklet, Air Cargoes, just issued by the Robert Gair Company, New York, manufacturers of shipping containers.

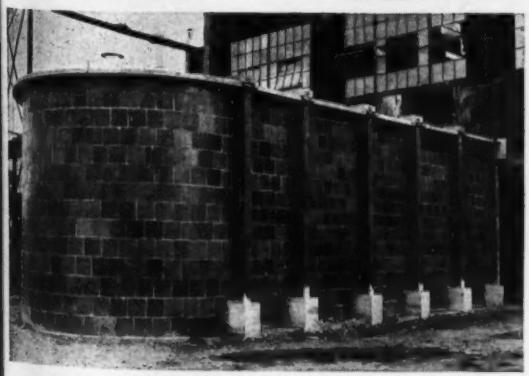
This booklet is fascinating reading and contains a gold mine of authoritative information for shippers who now use or are interested in the possibility of using air freight and express after the war. The predictions in Air Cargoes are not visionary. They are based on facts gathered from military and civilian experience—the same facts on which commercial air lines are basing their own post-war planning.

In addition to a comprehensive survey of the future of flying freight and express, Air Cargoes contains specific packaging information; requirements and recommendations arrived at through exhaustive research and experiment by the Gair people in collaboration with leading air lines; and detailed reports of tests made in Gair laboratories and in actual use by commercial shippers and the armed forces.

The Gair company believes that planes as large as the new Mars or larger will revolutionize air transport, reduce shipping costs materially, eliminate the necessity of warehousing some types of stocks at points which can be serviced by air in a few hours, open new markets for perishable products and greatly expand their distribution.

Manufacturers and distributors are invited to send for Air Cargoes, and to visit the Air Cargo exhibit at the offices of Robert Gair Company, 155 East 44th street, New York, where they can discuss prospective post-war packaging problems and prepare to take advantage of peacetime opportunities when "business as usual" is resumed. Most packaging needs can be filled with standard Gair containers but the company also welcomes opportunities to develop new types of containers to meet special requirements.

You Paper Mill Men • take a Tip on Kalamazoo Tile Stock Tanks and Chests • you can't beat them for STRENGTH and DURABILITY •



Kalamazoo Vitrified Glazed Tile

Is a "Natural" for Paper Mill Needs—

Smooth, hard, strong, easily cleaned and highly resistant to chemical action, this marvelous vitrified glazed tile type of construction is preferred by scores of leading paper mill executives and engineers. Adaptable for stock tanks and chests of all kinds. Costs no more than concrete tanks that require constant maintenance expense.

An exclusive method of glazed tile tank construction developed by Kalamazoo engineers. It provides greater flexibility and lower cost for all paper mill stock handling problems. Immediately available.

● Any Size or Shape Desired—

Wide, narrow—shallow or deep. Round, rectangular or square. Half-round or tapered bottom and corners. Mid-feathers and fins where needed to control stock flow. Adaptable to pumps or agitators. Construction individually designed to meet space, tonnage or production requirements.

Ask for engineering data.

Kalamazoo TANK & SILO CO.
KALAMAZOO - MICHIGAN

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 118 March 2, 1944 No. 9

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

CHICAGO PROFESSIONAL PAPER GROUP—First Monday of each month except July and August at Chicago, Ill.

INDUSTRY AND VICTORY

American industry has played a remarkable and vital part in the successful progress of the Allies in every division of the war—on the fighting fronts and on the home front. The amazing ability and capacity of our collective industry will form the bulwark of the peace years following victory. Although paper and its varied products are not durable goods, wood pulp in many forms has contributed to the war in a vital degree in its substitution for other more critical and scarcer materials. Thus the paper and other industries have used their manufacturing resources to defeat the powerful and highly organized forces of aggression.

An account of the invaluable aid rendered by American industry and its continuance is summarized in a booklet, "Industry and Victory," just issued by the National Association of Manufacturers. The contents include excerpts from addresses delivered at the Second War Congress of American Industry of the N.A.M., held in New York last December. The addresses are Production for Victory, by Charles E. Wilson; Transportation to Victory, by Joseph B. Eastman; The Battles Yet to be Won, by Major General L. H. Campbell, Jr.; Industry Meets the Emergency, by Rear Admiral W. H. P. Blandy, and Maximum Production is Still Ahead, by Tom M. Girdler.

In his address, Mr. Wilson states in part: "America can no longer afford to think of war production as a single problem. People must realize that over-all war production consists of a number of distinct programs, some of which will continue to rise while others are reduced. One program reaches its peak long before another; and in modern warfare, with constant changes in battle requirements, production must always be kept flexible and must follow the trends of military action. The fact that a number of programs go downhill while others still go up, is a healthy sign of the ability to meet the ever-changing requirements of total war. We are coming into a period of complex readjustment in production. Facilities, materials, and manpower will be released in one segment of the war production program when they are vitally needed in another segment. Unless this is thoroughly understood by the American public, and particularly by those who produce war material, our production task in 1944 is bound to be hampered. People must not be allowed to gain the impression that a cutback in a single segment of production means a curtailment in over-all production. It means no such thing. We can prevent confusion and move smoothly on our road only if America clearly recognizes that the adjustments and cutbacks which will be seen in 1944 are an essential part of our steady progress."

In his address Mr. Eastman points out that, "The need for the utmost possible conservation of rubber-borne transportation has been clear ever since Pearl Harbor, but it is pointed up most emphatically by the present situation with respect to tires, vehicles, and manpower. . . . The theoretical possibilities of conservation are considerably greater than present accomplishments, but only continuous, persistent work on many fronts will bring improvement. We are carrying on such work, but we need all the help we can get and we want yours."

Discussing ordnance, Major General Campbell states in part: "This then is my assurance, as chief of ordnance of the army, to you members of American industry, our co-partners in the industry-ordnance team. You have helped us magnificently and you are doing so at this moment. We have leaned heavily upon you for help and at no time more heavily than at this very moment. As victories continue to meet our efforts at home and on the battle fronts, I want you always to remember this that the industry-ordnance team must always be a team for the national defense of the United States. . . . You of American industry have stood by ordnance most loyally. Ordnance will stand with you always in peace as well as in war."

Declaring that he was proud of American industry, Rear Admiral Blandy said in part: "The responsibility for preparedness is basically the Army's and the Navy's but any future war that may occur will be an intensification of 'total war' as we know it now and almost certainly will occur with less warning than this one presented. The armed services can be successful in their attempt to erect effective prevention of such events as that which plunged us into this struggle just two years ago, only with the continued full cooperation of industry. We shall both have to maintain our present realization that a close

working partnership is vital both in peace and in the waging of war."

Asserting that the Japs and Nazis are stupid in thinking they could discount the great industrial system of America, Mr. Girdler said in part: "I believe industrial peace and cooperation between industry and labor is one of the prime requisites of prosperity in the post war period. Class conflict would prove disastrous. There are four corner stones upon which such a peace may be built, and I would describe them as follows: (1) Recognition of the principle of collective bargaining; (2) Recognition of the right of employees to join or not to join any labor organization; (3) Scrapping of the 'class conflict' idea in labor management relations, and recognition that cooperation between men and management naturally follows mutual understanding of each others' problems: (4) Incentive for investment and work—a fair return for venture capital, and fair wages for employees. . . . Do we always have to have a war to make us work hard—and work together? The answer is no! I am confident that we can achieve a lasting unity—a unity which will bring America a bright era of post war prosperity and power."

Give War Bonds for Suggestions

HUDSON FALLS, N. Y., February 28, 1944 — For valuable suggestions on methods of manufacture increasing production efficiency, $800 in war bonds and cash were awarded to employees of the Sandy Hill Iron and Brass Works at a recent meeting of the Sandy Hill Club.

Equally cherished were awards of gold buttons denoting membership in the Sandy Hill Club, given for having submitted a suggestion earning an award in cash or bonds. Other members of the club who submitted suggestions were presented by the company with silver emblems of membership.

The Sandy Hill Club is made up of about 60 employes who have "banded together to receive, consider and recommend meritorious improvements in methods and processes of manufacture, and new products." Clayton Howe is president, Howard Freeman secretary, and chairmen of the committee on suggestions are Arthur Langlois and Ernest Waters.

Membership in the club is open to all Sandy Hill employees who qualify by submitting a suggestion which is accepted.

"E" Flag Presented to Cochrane

The award of the Army-Navy "E" for excellence in production records was made yesterday to the Cochrane Corporation at exercises held at the plant, 17th street and Allegheny avenue, Philadelphia, Pa. High officials of the Army and Navy took part in the program, which was attended by the employees.

Among those who took part were Commander Floyd B. Schultz, U.S.N., who presented the flag; Joseph Tapley of the employees' committee; Major Victor W. Smith, U.S.A., who presented Army-Navy pins, and Percy S. Lyon, president and general manager of the corporation.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
January 15	91.2	January 16	88.1
January 22	89.2	January 23	87.9
January 29	89.2	January 30	87.1
February 5	90.9	February 6	87.2
February 12	89.6	February 13	88.4
February 19	92.4	February 20	89.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1943	87.2	88.9	89.5	88.7	91.4	84.8	84.3
1944	*90.1*	...	...	...	...	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1943	91.0	88.3	89.6	89.6	82.2	87.8

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year to Date..	89.2	65.1	77.9	88.2	87.0	104.1	87.6	*90.7*
Year Average .	79.8	71.5	83.4	85.6	97.4	90.4	87.8	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	87	*93*
1944	*90*	..	..	..	..	..	..	..	..	..	..	..	..

Week ending Jan. 15, 1944—93
Week ending Jan. 22, 1944—93
Week ending Jan. 29, 1944—95
Week ending Feb. 5, 1944—97
Week ending Feb. 12, 1944—97
Week ending Feb. 19, 1944—96

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Expect Heavy Post-War Demand

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, February 28, 1944—Announcement is made here by officials of the Bagley & Sewall Company that a heavy post-war business is expected and plans are now under way to meet the demand. The concern is noted for the high standard of its paper mill machinery and is receiving many inquiries regarding its ability to fill post-war contracts. The company has been able to carry on a certain amount of paper equipment work along with its war contracts and at the present time is rebuilding a 156-inch Fourdrinier paper machine with accessories for the Southern Chemical Cotton Company of Chattanooga, Tenn. This machine will be ready for delivery in several weeks and will be identical with the one sold six months ago to the Hercules Powder Company for its mill at Wilmington, Del. Its speed will range from 200 to 300 feet per minute on chemical cotton pulp manufactured from cotton linters. The chemical cotton pulp will be produced in sheet form upon the machine and will be used for high tenacity rayon yarn utilized in the manufacture of viscose rayon for tire cord for military tires. Because most metals have been restricted to war uses, the company has been unable to work on peacetime products for the past few years except with government approval. However, it was said today that war contracts are easing up and some materials are being released to civilian uses.

It is reported that paper is being made under heavy handicaps all over the country and many mills have had to carry on with minimum attention to machinery and with little or no replacements. As a result the Bagley & Sewall Co. and other pulp and paper machine manufacturers will, it is expected, be deluged with orders for new mill equipment as soon as the war status permits.

Which do you prefer?

¼¢ per ton lower cost for lubricants

OR

several cents per ton lower maintenance cost

Ask a Gulf Lubrication Service Engineer to explain how

Suppose an oil salesman offered you lower costs per gallon on lubricants equivalent to a reduction of ¼¢ per ton of paper produced in your mill. Would this be interesting to you if you felt that a lower cost per gallon meant using a lower quality lubricant on your expensive equipment?

Or would you be interested in a plan calculated to save you several cents per ton of paper by reducing maintenance costs of your motors, chippers, Jordans, beaters, and paper machines?

If you are interested in this plan, call in a Gulf Lubrication Service Engineer. Let him explain how these savings have been made in certain other mills and how it may be possible to do likewise in yours.

Back the attack with more War Bonds

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION · GULF REFINING COMPANY · Gulf Building, Pittsburgh 30, Pa.

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Notes on the Swedish Pulp and Paper Situation

By Edwin C. Jahn[1]

Abstract

A report is given on the current situation in Sweden in regard to wood supply and pulp and paper production. Technical developments are also briefly discussed.

In England where three months were spent studying the paper situation the author was fascinated by the way in which the British industry and the Government combined to solve the great problems facing the industry there. The way in which the situation was met, and the necessary papers produced in spite of fiber raw material difficulties has been described briefly in a previous paper by the author in "The Paper Industry and The Paper World", under the title "The British Paper Industry's Part in Total War".

Coming from England, a land of paper scarcity, to Sweden, a land of paper surpluses, is a strange experience for a pulp and paper man. Paper tablecloths and serviets are used with abandon. The newspapers are large and fat, and paper wrappings and sacks to cover purchases are of fine quality and abundant in quantity. It is a strange contrast: England with its great demands for paper and Sweden with its great capacity. The result in Sweden is an industry struggling to keep its plants in partial operation and not knowing quite what the future will bring in the way of markets.

Production Trends

The pulp production in Sweden is running under 50% of capacity, including pulp made for fodder and for domestic conversion to paper. Omitting the pulp for Swedish use, the per cent of capacity operation for export pulp is around 30%. Paper production is also down, being about 60% of normal.

One of the factors which has been a strong support to the pulp industry is the manufacture of fodder cellulose for cattle and horses. During the severe winters of 1940-41 and 1941-42 the manufacture of fodder cellulose greatly helped the food situation by supplying the farmers with necessary fodder for their stock. Since November 1940 over 1 million tons of fodder cellulose have been made. Last year the necessity for it declined, but there remained an appreciable quantity on contract to be made and this has been manufactured during the present year and will amount to perhaps 150,000 tons, including both sulphate and sulphite. The specifications have been changed, so that the pulp can also be used for paper, if no need for it as fodder arises.

The pulp industry is primarily an export industry depending on world markets. Now its market is restricted to German occupied Europe and a small amount to South America by safe-conduct ships, when they are permitted to operate. German occupied Europe does not provide much of a market. The German industry is quite large and the German policy is to keep it fully operating and import only what is necessary. Furthermore, Germany is finding it increasingly difficult to pay for imports and hence is buying less than it would take if Sweden would permit purchases on credit.

Viscose pulp is the main export pulp of Sweden at present. The lack of textile fibers in Europe has resulted in a fair demand for rayon pulp. Thus Swedish sulphite mills have been accelerated in their natural trend toward the high alphas and bleached pulps. This trend started before the war and the industry had a capacity of about 250,000 tons in 1938. Now the capacity is around 500,000 tons. Italy and Germany were the two best customers, buying, as all goods are purchased, under fixed trade agreements. Italy was the number one customer, having no viscose sources of its own, e.g., in the first few months of 1943, Italy bought about 8½ thousand tons of bleached sulphite pulp and Germany about 7 thousand tons per month. Amounts sold to other countries are small. Naturally the Battle of Italy has great repercussions on the Swedish viscose pulp industry. At one blow about half its already low export market has been cut off. The result was immediately perceptible in the closing down of some mills and slower operation of others. The amount of viscose pulp being shipped to Germany during the last half of 1943 is 25,000 tons, which is exactly one-third the amount Germany could buy under the trade agreement. Germany bought less than Italy because she has a large viscose pulp industry of her own and it is her policy to keep her own plants operating. The German demand is likely to decrease because of increasing labor and production difficulties there and the increasing difficulties in payments. In any case the prospects for viscose pulp exports to Europe this winter and coming year are very poor indeed.

The unbleached sulphite export market is very weak, amounting to only about 3,000 tons per month

[1] Member TAPPI; Professor, New York State College of Forestry at Syracuse University and Research Collaborator, U. S. Department of Agriculture. Dr. Jahn is at present studying the pulp and paper industry in Sweden and Finland and technical articles on the industry there will be prepared.

on an average. This is scattered among the European countries and Argentina. The sulphate market is a little better, particularly for unbleached sulphate, which averages about 15,000 tons export monthly. This is due to the war-time demand for pulp for wrapping, sacks and binding twine paper in Germany and occupied Europe. Nevertheless this is but a small fraction of the 1 million tons Swedish kraft pulp capacity. There is practically no export demand for mechanical pulp and the export groundwood mills are probably not operating at over 10% capacity.

The paper situation is better because it is based to a larger extent on domestic markets. As a result it is operating at about 60% capacity. The fine paper mills, for example, have very little export market and have been enjoying nearly full production, although recently there has been a slight dropping off. Greaseproof on the other hand, although not a large item in Swedish production, has had a fairly large export market in normal times and is now rather badly off. The sulphite papers mills also have very small export now. Newsprint, on the other hand, has increased its domestic market considerably, to over 100,000 tons and has also had a fair export market to Argentina until last month, when the safe-conduct ship traffic was stopped by Germany.

The kraft mills have been doing fairly well for several reasons, if one can consider that operating at two-third capacity is doing fairly well. The domestic market has been steady, largely due to an increased demand for sacks, especially for charcoal for automobile fuel. This however, now seems to be dropping off due to a "peace scare". Furthermore, during the war there has arisen a demand in Germany and some of the occupied countries for "spin paper". This is a specially strong tough kraft which is cut in small strips and woven into binder twine for harvesting and sacks for potatoes, vegetables, grain, etc. However, the export demand for this paper is declining, the amount taken by Germany during the last 6 months of 1943, being only 19,000 tons, whereas the German-Swedish trade agreement would permit an export to Germany of as much as 40,000 tons for this period. Only scattered small amounts go to other countries.

The general picture at the moment for pulp is a decline in recent months in viscose production because of the loss of the Italian viscose market. Other pulps, however, have held steady and recently sulphate has even increased somewhat in production. For paper the situation is steadier, due to the stabilizing influence of the domestic market. However, the export demand for paper is declining due to a number of factors, such as the recent loss of the Danish market and the "peace scare".

Stocks

Stocks of pulp are fairly normal and many sulphate and sulphite mills (other than viscose) are operating at a slow pace, if they are designed to do so, until their magazines are full. By the time of open water in the spring it is expected that the pulp stocks for sulphate and paper sulphite will be normal or they could easily be if the mills wish to operate. Due to the great variety in specifications for viscose pulp, this commodity will not be stocked to any extent. A sudden end of the war, therefore, would see Sweden prepared to supply considerable demands for kraft and paper sulphite pulps, if such demands arise.

Wood

The wood situation is good. The mills have ample supplies on hand even for normal full operation, because they were able to get workers into the woods for cutting operations. Due to the decreased pulp and paper production and the mild winter of 1942-43 and the mild autumn of 1943, the wood consumption has fallen. The wood allotted by the Government for the winter 1942-43 for fuel is 15 million cubic meters (piled) for pulp and 40 million cubic meters (piled) for fuel.

Most mills must now burn waste wood (some use wood and peat) and of course, homes and offices also burn wood. Coal is reserved for storage and certain vital industries. The general opinion is that no inroads have been made into Swedish forest reserves and that the cuttings balance regrowth. Much of the wood burned in homes and offices is birch. Great piles of it fill the parks and byways of all towns and cities.

The wood burned by the industry is, besides sawmill waste, mainly of very poor quality with much rot and defects and is quite unsuitable for either sawlogs or pulpwood. Many old stumps and deadwood are collected so that in many areas the forests are being nicely cleared of debris and defective material. Naturally, a considerable amount of good material also finds its way to the fuel pile, but the amounts do not seem to be serious, a condition likely to hold if the war does not last more than a year or two more.

Wallboard

Sweden has a modern well developed wallboard industry, which in 1939, had a capacity of 138,000 metric tons. Since then the capacity has been increased and by 1944 it is expected to be 200,000 tons, after new plants now under construction are completed. During the war this industry has enjoyed good business and has operated at a high per cent of its capacity.

Demands by the Swedish Army for barracks and purchases in anticipation of rising building material prices have been reasons for the good wallboard demand during 1940-42. During 1943, however, there has been some falling off in wallboard production. Probably people are now postponing building construction until after the war, anticipating, this time, price decreases.

Trade and Sales

Naturally, Sweden being completely surrounded by war is in a difficult trade situation. First, it can trade with only one group of belligerents and such neutrals as can be reached by German permission. Furthermore, the situation is complicated by the disappearance of the individual customer in Germany, and arising in its place, group or national buying. In order to protect its interests, therefore, Swedish mills had to unite their sales and prices under their Pulp and Paper Associations. The Government appoints a commission which meets with the German or other national committee and arrives at a trade agreement whereby for a given period, certain tonnages are permitted to be shipped at agreed prices. These tonnages cannot be shipped unless money has been deposited or the equivalent in goods has been received. As a result the amounts of pulp and paper shipped to Germany are usually less than the permitted amounts under the agreement.

Nevertheless, trade with Germany has brought to Sweden certain vital products which has helped keep her industry going. These include coal, iron and steel products, fertilizers and chemicals, such as salt cake.

Prices for both pulp and paper have risen considerably during the war. Export prices have risen more than domestic prices. Export prices for kraft papers, e.g., are about 2½ times prewar prices, whereas the domestic price increase is less than 1½ times that of the prewar price.

Technical Developments

The war period has not found the Swedish technical men sleeping. Many improvements and new techniques have been applied in various mills. In general, the tendency toward higher quality, characteristic of the Swedish industry, has continued. Beautiful bleached sulphates and sulphites, as well as unbleached grades are being produced. Care is exercised throughout the processes, from the selection of chips, through the cooking, screen, bleaching, and final operations. Improved equipment has been installed in many plants, increasing both quality and capacity and also increasing the mechanization of the plant. Interesting systems of sulphite waste liquor disposal have been developed.

Byproduct developments are striking, although for the most part they are based on sulphite alcohol and sulphate tall oil. Sulphite alcohol is being produced for use directly as motor fuel and for drinking liquors. Furthermore, this alcohol is being used as a raw material for making ethylene oxide, ethylene dichloride and acetaldehyde. The ethylene oxide is the intermediate product for making triethanolamine, ethylene glycol and various glycol derivatives. From ethylene dichloride is made the artificial rubber, "thiokol." Acetaldehyde is the base for making butanol, butyl acetate, ethyl acetate and other chemicals. Furthermore, cymol is recovered from the sulphite relief gases and is used as a base for making toluol and other chemicals.

Tall oil from sulphate waste liquors is a source of turpentine, resins, soaps, glues, and cracked oils for various uses and a variety of other products. Efforts are being made to increase the usefulness of this raw material.

In general, these developments are part of the general efforts of Sweden's policy of striving towards "self-sufficiency". Cut off by the war from her normal imports Swedish industry has made great strides towards providing for her own needs. The war has been a great catalyst to Swedish chemical industry. The forest raw materials of the country have provided hundreds of necessary commodities. Wood has replaced coal as fuel. It has nearly completely replaced gasoline as a power fuel. More than 70,000 automobiles are being operated on charcoal or wood. Furthermore, sulphite alcohol is being used mixed with gasoline as a liquid fuel for military uses. Wood distillation plants are supplying methanol, acetic acid, acetone, methyl acetate, turpentine and lubricating and fuel oils, the latter for marine engines.

Cellulose derivatives are also being made on a small scale, particularly water soluble types, suitable for glues and adhesives and for giving body to certain food products.

Research

Swedish industry is very research minded, many fine modern laboratories having been built in the pulp and paper and other industries. Other plans have been drawn up by other pulp and paper companies for new research laboratories. Some of these laboratories are magnificent institutions, well-equipped with fundamental research and pilot plant equipment and having large staffs of scientists and technical men.

The plans for a new large central research laboratory in Stockholm have been approved, and construction is expected to start soon. This Institute for Wood Research will be supported in part by the Government and in part by the forest industries, represented by the Swedish Wood Research Foundation. The Institute will have a chairman appointed by the Government and five members appointed by the Government and five by the industries. The industries supporting the Institute are (1) the six large organizations of the Swedish Cellulose Association, (2) the Association of Swedish Paper Mills, (3) the Association of Swedish Wallboard Manufacturers and (4) the Association of Swedish Plywood Manufacturers.

Now Witco Chemical Co.

Wishnick-Tumpeer, Inc., New York manufacturers and distributors of chemicals, pigments and asphalt products, has changed its name to Witco Chemical Company. No changes in corporate structure, management, or personnel are effected by the change in name, which is based on the company's long established trade-mark "Witco."

The decision to adopt the new name was prompted by the feeling that the firm name should be more descriptive of the business and consistent with the company's activities in the fields of chemical research and manufacture.

Since its founding in 1920, Wishnick-Tumpeer's development in the chemical industry has been characterized by a continual expansion of its manufacturing facilities as well as the broadening scope of its line of chemical products.

In 1926 Witco acquired the Pioneer Asphalt Company plant in Lawrenceville, Ill., followed in 1933 by the purchase of the Panhandle Carbon Company in Borger, Texas, where Witco Carbon Blacks have been manufactured ever since. Four years ago a new research laboratory was added in Chicago along with the erection of a plant for the manufacture of chemical specialties.

Like all others in the chemical industry, Witco Chemical Company is actively engaged in war work, with its laboratory concentrating particularly on the study and solution of synthetic rubber compounding problems.

Index Value of Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 1, 1944—Indexes of the value of paper mill shipments in December, 1943, was 163 compared with 163 for November and 144 in December, 1942, taking an average month in 1939 at 100 according to the monthly industry survey of the Department of Commerce.

Also the indexes of the value of paper manufacturers inventory for December, 1943, was 123.1 compared with 127.3 for November and 144.0 for December, 1942, also taking an average month in 1939 at 100, the same figures show.

The Fundamentals of Asbestos Friction Materials*

By R. T. Halstead[1]

Abstract

By applying a brake, and thereby bringing the friction material into contact with an opposing metal member, energy of motion is converted largely into heat energy which in cases of severe service may result in operating temperatures of 1000° F.

The effect of heat on the physical characteristics of friction materials is reviewed. The more common factors contributing to poor performance of friction materials are discussed.

A friction material, when properly applied to any type of energy converter such as a brake or clutch, may be considered as a medium by means of which energy of motion is converted largely into heat energy.

When a brake is applied to a rotating mechanism, work is done in retarding the motion of the moving part. One finds that three important things happen at the interface (Fig. 1) between friction material A and the contacting metal surface offered by B.

1. There is a generation of heat.
2. There is a mechanical abrasion of the friction element A.
3. There is a mechanical abrasion of the metal surface presented by B.

The relative magnitude of these three effects is listed in the foregoing in decreasing order of their severity or extent. The generation of heat has been estimated by various investigators to account for more than 99% of the total energy conversion. The visible extent of this heat generation has been observed by means of thermocouples to result, in cases of severe braking action, in temperatures as high as 1000° F. Actually, flash temperatures in a substantially higher range no doubt exist at least momentarily at the interface (Fig. 1) between A and B since incandescence can frequently be observed in the course of severe brake applications. Further substantiation of a relatively high temperature condition is frequently found in the general appearance of the contacting metal surface which may be covered by oxide films that normally form only at temperatures in excess of 1000° F.

*Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

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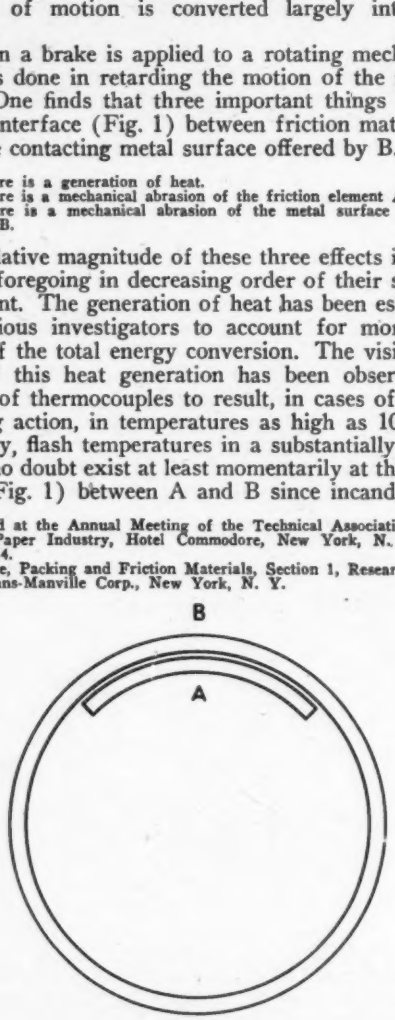


FIG. 1
A. Friction Material
B. Opposing Metal Surface (Drum)

Performance Characteristics

From a consideration of the factors involved in applying a brake, it may be concluded that a satisfactory friction material must possess the following performance characteristics:

1. At all operating temperatures it must have a sufficiently high coefficient of friction to perform satisfactorily.
2. It must not wear too rapidly.
3. It must not abrade the opposing metal surface (B) too rapidly.

Each of these listed characteristics will be discussed briefly:

Coefficient of Friction

The quantitive implications of this term are well known and much data of general interest are available purporting to show the relationship or ratio between (1) the weight of a body presenting a plane contacting surface and (2) the force required to slide that body across a table-like surface upon which the body rests.

In any consideration involving coefficients of friction, it therefore is imperative that due thought be given to the relationship between the friction material and the metal member to be used as the opposing surface. This metal member, which constitutes the conventional brake drum, pressure plate or other similar rubbing surface, is most frequently composed of a ferrous metal, either steel or cast iron, although other alloys, i.e., notably those of copper, have received limited recognition in the case of certain specific applications.

When used against different metals, a standard friction material was observed to have coefficients of friction ranging from 0.3 to 0.5. In Table I are recorded the values observed at 350° F. in tests involving the metals indicated.

TABLE I.—COEFFICIENT OF FRICTION OF STANDARD MATERIAL EVALUATED AT 350° F.

Against steel	0.50	
Against cast iron	0.36	
Against aluminum	0.3	(scored)
Against bronze	0.35	
Against copper-beryllium	0.37	

A well known manufacturer of heavy machinery, after months of experimentation, has concluded that cast iron represents the best all purpose metal for general utility service. A high carbon iron (3.5 to 3.8% total carbon) unalloyed with other metals, represents the best type of composition for general service. A high graphitic carbon content, with iron showing a maximum of pearlitic structure and a minimum of cementite, offers desirable properties.

It is to be noted that the coefficient of friction values given in Table I apply when an operating temperature of 350° F is maintained. The effect of

temperature on friction is generally quite pronounced, tending to reduce the value of the coefficient of friction as the temperature increases. This trend is clearly shown in Fig. 2.

The ideal friction material is envisaged as one showing a coefficient of friction which is independent of temperature.

Commercial friction materials in general usage today rarely exhibit coefficients of friction in excess of 0.60. A conventional classification of friction materials into high, medium, and low friction categories would normally approximate the following ranges of values:

CLASS	COEFFICIENT OF FRICTION
High friction	0.60-0.45
Medium friction	0.45-0.30
Low friction	0.30 and less

Abrasion of Friction Material

This factor deals with the rate at which the friction element is worn away under service conditions. The rate of wear is generally influenced greatly by the factor of temperature, tending to increase with rise in temperature.

The effect of temperature on the rate of wear of standard types of friction materials is illustrated by the following data:

TABLE II.—RATE OF WEAR OF STANDARD TYPES OF FRICTION MATERIALS EVALUATED AGAINST CAST IRON AT VARIOUS TEMPERATURES

Temperature of Test Deg. F	Rate of Wear (Cu. Inch per h.p.-hr.) Woven Lining	Rubberized Fabric Lining	Molded Lining
160	.0012	.0015	.0014
350	.0062	.0028	.0030
500	.0223	.0130	.0073
800	.7620	.5630	.0611
1000	——	——	.2047

The desirability of a friction material which will last as long as possible without wearing out is obvious. Yet, this factor of very low wear may give rise to other serious operating deficiencies in the friction material such as loss of braking effectiveness due to a glazing of the wearing surface of the friction element. Such glazes are the product of the burnishing action of the contacting drum, plate, or other metal member, and constitute an all too frequent cause of lowered friction. Since adoption of a faster wearing block will minimize glaze formation, it becomes evident that there are optimum values for wear, which are not necessarily the *least* values.

When a standard type of friction material is tested against various metals, it is interesting to note how the rate of wear is affected. Steel and cast iron surfaces normally cause approximately the same rate of wear of the friction element, although steel is more prone to score under severe service conditions and may thereafter give rise to a more rapid abrasion of the friction element. In Table III is presented some typical wear values obtained at 350° F in tests of standard types of friction material operating against various metals.

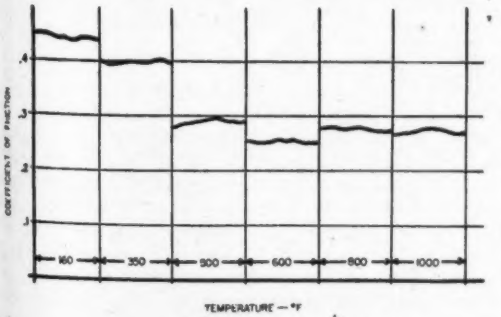


FIG. 2

Coefficient of Friction of Standard Friction Material Evaluated at Various Temperatures.

TABLE III.—RATE OF WEAR OF STANDARD TYPES OF FRICTION MATERIALS EVALUATED AGAINST VARIOUS METALS AT 350° F.

Metal Member	Rate of Wear (Cu. Inch per h.p.-hr.) Woven Lining	Rubberized Fabric	Resin Bonded Molded Lining
Cast iron	.0062	.0028	.0030
Steel	.0053	.0027	.0050*
Aluminum	Excessive*	Excessive*	Excessive*
Bronze	.0053	.0065	.0026
Copper beryllium	——	——	.0024

* Scored badly

In a subsequent brake block test in which a copper-beryllium alloy was used as a drum material, it was noted that a standard friction material wore less rapidly than when similarly tested against cast iron. However, when the equilibrium temperatures under the conditions of test were considered, it was found that the copper-beryllium drum was operating at a temperature approximately 100° F cooler than the equilibrium temperature of a similar test in which a cast iron drum was used. Thus the appreciable difference in rate of wear observed in this case was undoubtedly due primarily to the difference in the two operating temperatures, which in turn may be ascribed to the notably higher heat conductivity of the copper-beryllium alloy rather than to any specific difference between the physical surfaces of the two types of metal drums involved in this case.

It may be safely concluded that the rate of wear or abrasion of friction materials is influenced far more by temperature than by the composition of the smooth metal surface rubbing against the friction element.

Abrasion of the Metal Drum or Plate Surface

Mention has already been made of the tendency shown by steel to score under severe service conditions whereas cast iron, under the same conditions of test, performs satisfactorily. The term scoring is used to denote uneven and generally severe abrasion of the metal member, and generally results from a lodgement in the wearing surface of the friction element of particles or bodies capable of gouging and roughening the drum surface. The main difference between steel and cast iron in their tendency to abrade probably resides in the relatively increased tendency of the steel to yield metal splinters or slivers as a product of abrasion. These steel slivers readily embed themselves in the wearing surface of the friction element and thereafter cause further scoring of the opposing metal surface.

Cast iron in contrast to steel tends to yield a fine dust as a final product of its abrasion. The cast iron member in this case is polished and gently eroded, but is not prone to be seriously roughened throughout its period of contact with the friction element.

In addition to scoring and erosion of the drum, another form of deterioration of the metal member is well known. Under severe service conditions a disruption of the drum surface can in certain cases be readily produced. Failure in these instances is due to the development of heat checks or cracks in the wearing surface of the drum. It is probable that this type or failure is due to a surface fatigue of the metal which produces fine surface fissures that normally become progressively worse as the braking applications continue. Probably all friction materials tend in varying degree to heat check the opposing metal

member if the service conditions are severe. It has been noted, however, that friction materials that are relatively abrasive in their action on the metal drum are much less prone to heat check, due no doubt to their ability to scour the metal surface and eradicate heat checking fissures in their incipiency.

The resilience of a friction material also appears to be a factor in determining whether or not that friction material will tend to cause heat checking. In accordance with this concept, the more resilient type of friction material will produce less mechanical deformation of the drum due to its ability to yield locally and accomodate any inequalities in the contour of the drum surface.

Also, on this basis, the more malleable metal drum, with its greater tendency to flow locally and thereby accomodate the surface inequalities, should be more resistant to the development of heat checking than would a less malleable metal drum. Consonant with this premise, steel drums tend to heat check less readily than do those made of cast iron.

In a series of tests conducted by a truck manufacturer who was interested in establishing the life characteristics of clutch facings, a test program was conducted on facings representing various compositions which had been designed to give improved wear. In the course of this investigation, it was eventually found possible to reduce the clutch facing wear factor from a relative value of 0.076 to a value of 0.023. With this improvement in wearing qualities of the facing, it was noted, however, that the life of the pressure plates used in contact with the improved facings was much shortened due to increased wear of the metal member. This interrelationship in the functional performance of A and B (Fig. 1) eventually necessitated the selection of a compromise wear value which took into account the life expectancy of both the pressure plate and the clutch facing.

Observations such as the foregoing serve to promote the concept that drum or pressure plate life and the wear characteristic of the friction material are associated in a relationship of the two curves shown in Fig. 3. The solid curve A B is representative of the performance observed in the specific case of the clutch facings referred to in the preceding paragraph. These facings consisted of molded compositions of high density, bonded together by means of thermal setting resins. For most types of friction materials, however, the curve A C reflects the characteristic behavior.

Other Characteristics

In addition to the three physical considerations relative to friction, wear and drum abrasion which have been discussed in the foregoing, there are other

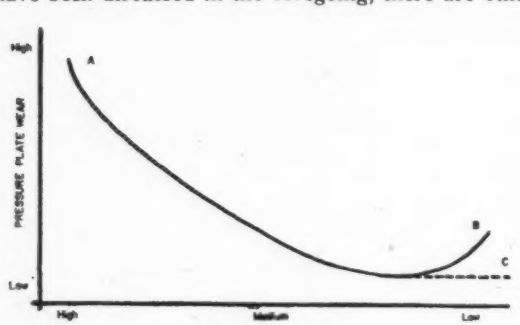


Fig. 3

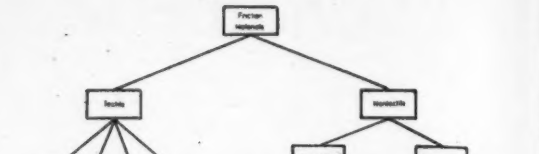


Fig. 4
Commercial Types of Friction Materials

characteristics which must be considered in reviewing the qualities of a friction material, i.e., the thermal swell of a friction element must be of low order of magnitude; the frictional characteristics must not become unduly erratic due to the presence of moisture; brake or clutch applications must be possible without the development of appreciable noise; the physical strength of the friction element must be such as to prevent any shearing action by the rivets; and it is often important that the friction material be capable of operating in oil without undergoing appreciable disintegration or softening.

Such, in brief, are the physical properties which must be considered in weighing the quality of commercial friction materials. A review of the field shows there are numerous types of friction materials on the market which can best be catalogued and classified in terms of the general construction or type of composition represented by each kind of product. In the following diagrammatic schedule (Fig. 4) is presented a summary of the various types of friction elements.

Friction Material Components

In considering the array of products listed in Fig. 4, it is pertinent to review the various raw materials used in the manufacture of these friction materials.

It is asking much of any organic material to exist and function as a stable entity at temperatures of a 1000° F and higher. Vulcanized rubber softens at 300° F and the best thermal setting resins begin to carbonize at 600° F. Is it therefore necessary to rely on inorganic raw materials, either metallic or nonmetallic, in order to secure adequate thermal stability in the friction element? The best procedure calls for the utilization of all of these types of raw materials, organic, metallic and inorganic, each of which, when blended with the others, contributes valuable physical properties.

Asbestos

The selection of asbestos as the bulking or preponderant ingredient in friction materials is logical. In this material nature has provided in abundant quantities a noncombustible, heat resistant, inorganic fibrous substance which can be readily molded, carded, braided, woven, or otherwise processed into a variety of finished goods. There are several kinds of asbestos fiber commercially available, each differing substantially from the others in chemical composition.

Asbestos fiber of the chrysotile type, which is mined extensively in Canada, is a chemical entity known as hydrous magnesium silicate, a mineral

which when used in conjunction with suitable quantities of the proper binder or impregnant offers optimum qualities of high friction and frictional stability without unduly tending to abrade or score the metal member working in contact with the friction element.

Some asbestos fibers are much harsher than others. The amosite and crosidolites, which are less highly hydrated than chrysotile, and are chemically quite different from it, are good examples of fibers which are harsh enough to induce drum scoring under conditions in which chrysotile does not score. It is hard to compare the relative performance of different fibers since it is difficult to establish whether the massive fiber bundles, as obtained from the mines, have been reduced in the processing operations to fibrous dimensions which are comparable in each case. It is interesting to note that the fiber mass can be reduced to macroscopic fiber pencils of relatively small diameter, that these latter may be further subdivided into fibers of microscopic size. However, these microscopic fibers, when viewed under the electron microscope, have been observed to be aggregations of still smaller fibers, estimated to be of the order of 0.01 micron in diameter. There is, of course, no assurance that these fibers of 0.01 micron-diameter represent the ultimate in minimum diameter to which they may be reduced. This unique structural feature of asbestos, coupled with its relatively excellent heat stability, provide basic reasons why it is so outstandingly superior to other inorganic fibers, such as glass wool or slag wool, for use in friction materials.

Bonding Mediums

The next major ingredient in friction materials is the bonding medium which cements together and seals the asbestos fibers into a solid and relatively dense structure. Pitches and drying oils were at one time widely used to bond the fibrous structure together to give a friction element. Rubber was used in this connection and, more recently, thermal setting resins have been employed, either by themselves or in combination with various other binders. Such compositions have specific physical characteristics which reflect the nature of the binder to a decided degree. Thus, a rubber bonded friction element with high friction and low wear characteristics may be recommended for relatively low temperature operating conditions. However, such a material loses its high friction characteristic and undergoes rapid wear if the operating temperatures are increased sharply. In this latter case involving higher temperatures, the service condition can possibly be best met by using a mixture of rubber and a suitable thermal setting resin, or possibly by using a thermal setting resin alone as the binder, in which case increased resistance to high temperature wear may be safely anticipated. A greater degree of frictional stability will also be acheived by the presence of the resin, but in general the friction element will no longer manifest high friction characteristics comparable to those initially observed in the case of the rubber bonded material. It therefore becomes evident that the role of the bond is manifold and important in its effect on the physical and frictional properties of a commercial friction material.

Friction Modifiers

To the fundamental composition of fiber and bond is introduced secondary ingredients which may be designated as friction modifiers, of which metal is a customary addition. The metal addition, generally brass, zinc, or lead, confers specific properties on the composition. In this connection, brass contributes to frictional stability of the friction element, also to an improvement in its wear qualities and, when introduced as wire in the case of woven fabrics, results in improved tensile strength and resistance to shear. Introduction of zinc also helps to improve wear characteristics and to stabilize the frictional qualities, but such stabilization is obtained at the expense of the general frictional effectiveness which simultaneously undergoes an appreciable reduction. Lead additions function primarily as high temperature lubricants, also in minimizing any abrasive qualities shown by the composition.

In friction materials of the nonfabric type, a second type of modifier, namely, a friction particle, is often times introduced into formulations in order to impart specific frictional and wear characteristics. The particles used range from groundup tire peelings to complex resinous admixtures of outstanding thermal stability; they embrace the field of carbonaceous materials such as anthracite, coke, or other pyroligneous product; even ordinary silica has found its way into certain types of friction elements, although such usage is not general and is considered unorthodox.

From the foregoing, some idea may be obtained of the considerations entering into the formulation of a commercial friction material. A few years ago the manufacture of friction materials was far more an art than a science. Today much progress can be reported relative to the development of friction materials along sound fundamental lines, to the point where an engineer may now request a friction element for a specified type of service condition and obtain a commercial product which has been designed to meet his requirements. Development of new products in the field of resin chemistry offers a great promise to the friction materials industry which recognizes this fact and is conscious of the great opportunities for further improvements which lie ahead.

In conclusion, this discussion of the fundamental characteristics of asbestos friction materials is submitted at this time because industrial friction material problems affecting the paper industry appear to have multiplied in recent years. With the use of larger and higher speed papermaking equipment, finishing and converting equipment has been increased proportionately and has presented some rather severe braking problems, particularly on rewind units. It is certain that the data and review of the subject presented at this time will be of benefit to the designers of papermaking equipment. It is proposed that another paper dealing with the practical use and application of asbestos friction materials be presented. However, an understanding and appreciation of the physical limits and fundametal characteristics of asbestos friction materials will be of decided help to all concerned.

Pulpwood Cutting Unit Shown

A motion picture of a tree cutting device for felling trees was shown to some members of the pulpwood industry last week. The equipment was developed by Kirk Knight, Jr., formerly of Bartlett, Tex.

The equipment consists of a powerful shearing unit mounted on the side arms of a 45 hp. bulldozer. It is said to be capable of doing the work of 200 woodchoppers. The device, it is understood, has not yet been put into production.

Luminescent Pigments*

By G. F. A. Stutz[1]

Abstract

Both the fluorescent and phosphorescent types of luminescent pigments are defined and generally described. Exciting light sources for such pigments are also described. Since practical applications in paper and printing ink are mostly limited to the inorganic fluorescent pigments, zinc, and zinc and cadmium sulphides, these pigments are described in most detail and their properties given. Chemical characteristics, suitable vehicles, fluorescent color, daylight color, fluorescent brightness, and afterglow are discussed.

The phenomenon of photoluminescence in which some form of radiant energy, usually ultraviolet light, is absorbed and is then reemitted as light of a longer wavelength, usually visible light, has been known for many years. However, it has been principally of scientific interest and has found only limited commercial application until the so-called fluorescent lamp was introduced several years ago. This lamp consists of a low-pressure mercury arc in a glass tube, the interior of the tube being coated with luminescent powders. The powders are usually silicates and tungstates and they absorb the ultraviolet light of the mercury arc, reemitting it as visible light. The present war effort is largely responsible for further accelerating scientific study and development in the field of photoluminescence and for bringing about practical applications other than the fluorescent lamp. It is the purpose of this paper to review some of the presently used photoluminescent materials and their properties, considering particularly those pigments of interest to the paper industry.

Luminescence is the term generally applied to the emission of visible light following the absorption of activating radiant energy. There are two types of luminescence: fluorescence and phosphorescence. Fluorescence is a luminescence which continues only during the period that the activating light source is shining on the material. Phosphorescence is a luminescence which continues for some period after the activating light source is extinguished, the period of afterglow being from a few seconds to many hours. Therefore there is a distinction between fluorescent pigments which have no afterglow and phosphorescent pigments which have a useful lag or afterglow. The discussion is limited to those materials which employ the long ultraviolet, or so-called "black light" region of the spectrum for their activation. This is the range just short of the visible, from 3200 to 4000 Angstrom units.

Exciting Light Sources

The exciting light sources useful with luminescent pigments responding to the long ultraviolet spectral range, are quite varied and numerous.

Daylight is an excellent exciting light source since it contains a large amount of energy in the spectral range from 3200 to 4000 Angstrom units. It cannot be generally employed, however, since fluorescent materials must generally be viewed under conditions of complete absence of visible light and it is therefore only used for the excitation of phosphorescent materials having a long period of afterglow.

Incandescent filament lamps are a reasonably satisfactory source of exciting light and the ordinary tungsten filament lamp, equipped with a nickel oxide glass filter, is often used. It contains more ultraviolet light if burned at overvoltage as in the photoflood lamp. The two-cell or three-cell flashlight, suitably filtered, provides a weak source of exciting light. The ordinary automobile headlight, suitably filtered, furnishes a moderately strong source of exciting light.

Argon glow lamps have an appreciable amount of their total radiant energy in the long ultraviolet, and are therefore satisfactory sources for exciting luminescent materials. Again best results are obtained if they are suitably filtered by a nickel oxide glass filter.

Mercury vapor lamps have been most widely used for excitation. The high-pressure mercury arc is particularly rich in long ultraviolet energy and has been fabricated in varying sizes, including 100 watts, 400 watts and, by water cooling, 1000 watts and even more. Again for satisfactory use with fluorescent materials, such sources must be filtered with nickel oxide glass filters.

Fluorescent lamps developed within recent years also serve as a most satisfactory source of exciting light and they are most widely used at the present time. The fluorescent lamp consists of a low-pressure mercury arc, emitting most of its energy at 2536 Angstrom units confined within a glass bulb, the inner surface of which is coated with a luminescent powder which converts the short wavelength energy of the mercury arc into visible light. Bulb manufacturers have developed a special phosphor "360BL" which converts most of the 2536 energy to 3600 Angstrom units, giving an efficient source of long ultraviolet light. These low-pressure mercury arcs can be made in a wide variety of sizes, the smallest of which is a 4-watt unit designed for operation on a 24-volt battery circuit and known as the RP-12 bulb. This RP-12 bulb is the one most used in the military application of luminescent materials today.

Fluorescent Pigments

Fluorescent pigments for use with exciting light in the long ultraviolet range may be divided into two groups; those which are organic in chemical composition and those which are inorganic.

Many organic materials display the phenomenon of fluorescence. Vegetable oils, mineral oils, and many natural fibers have strong fluorescence. Practically all synthetic organic colors are more or less fluorescent and certain of the synthetic dyes are strongly fluorescent under long ultraviolet excitation. The organic fluorescent materials in use today are synthetic dyes, dye intermediates, and metallic salts of dye intermediates. The dyes include such materials as rhodamine, eosine, and flavine. Their fluorescence is a characteristic of their molecular structure and

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Development Engineering Division, Technical Department, The New Jersey Zinc Company (of Pa.), Palmerton, Pa.

they therefore fluoresce most brilliantly when dissolved in suitable media or when applied to fibers. The dyes generally lend themselves readily to the preparation of fluorescent printing inks, lacquers, paper coatings, dyed plastics, dyed wood pulp fibers and other dyed fibrous materials. From the standpoint of printing ink manufacture, quite satisfactory smoothness can be obtained since the dyes are dissolved in the vehicle. Such dyes, however, have relatively poor fastness to sunlight and daylight, and this constitutes their principal weakness. In the form of printing inks, coated papers, lacquers, and the like, extreme care must be taken that the fluorescent dyes are not given undue exposure to sunlight or they will lose their fluorescent property and will also lose much of their daylight color. They have the desirable property that, in general, their daylight color and their fluorescent color are quite similar. The fluorescent colors obtainable cover the range of the entire visible spectrum and are characterized by their saturation and brilliance.

Somewhat more stable pigments may be prepared by precipitating the dyes on suitable inorganic base materials, such as aluminum hydrate, to form lakes.

A number of intermediates and other organic materials show fairly strong fluorescence and in many cases the fluorescense of these materials can be further increased by preparing metallic salts from them. An outstanding example of such a material is the zinc salt of 8-hydroxyquinolin which is white in daylight color and exhibits brilliant green fluorescence. Such metallo-organic salts as this one are considerably more stable on exposure to sunlight than are the organic dyes. Again they lend themselves readily to the preparation of quite satisfactory printing inks and coated papers.

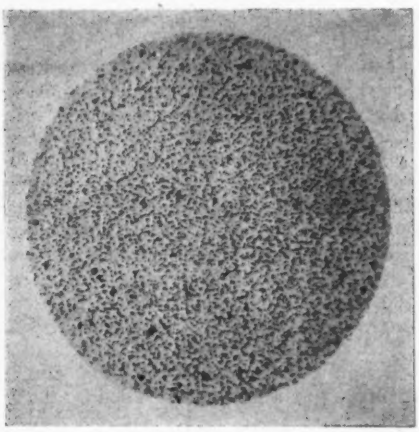
The inorganic types of fluorescent materials are also widely distributed in nature and are usually known in the form of ores such as fluorite, sphalerite, willemite, and scheelite. In many cases the fluorescent property is used as a means of discovering, identifying, or separating such minerals. The commercially useful fluorescent pigments, however, are rather limited in number and they are generally sulphides of zinc or combinations of zinc and cadmium. Such pigments must be produced under conditions insuring the greatest possible purity, using very small and controlled amounts of activating heavy metals such as copper, manganese, and silver. The pigments are prepared by calcination at relatively high temperatures and as a result their particle size is somewhat coarse as compared with ordinary pigments. The average particle size of the zinc and cadmium sulphide fluorescent pigments is about 1 micron which is three or four times as coarse as most ordinary paper and printing ink pigments. The daylight color of these materials varies from white to yellow, while the fluorescent color ranges from blue to dark red. In general, the orange and red pigments are highest in cadmium sulphide content.

Phosphorescent Pigments

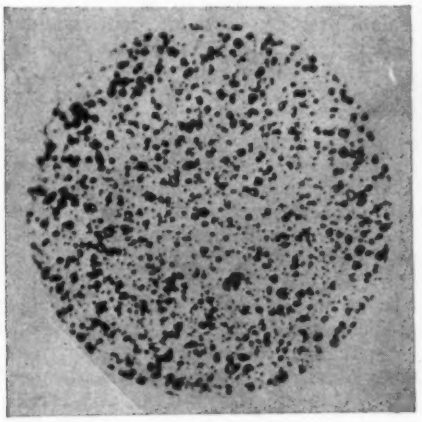
Phosphorescent pigments exhibit luminescence after the exciting light source is removed, that is, they have an afterglow. They may be subdivided into two groups, those having a short afterglow (up to 2 hours) and those having a long afterglow (6 to 24 hours or more).

The short afterglow phosphorescent pigments are zinc sulphides and combinations of zinc and cadmium sulphide. They are prepared in much the same way as the fluorescent inorganic pigments except that they are calcined at higher temperatures. They are therefore quite coarse (5 to 20 microns) and are not easily fabricated into filled paper, paper coatings or printing inks. They are quite stable, similar to the fluorescent inorganic pigments, but because the afterglow is comparatively short, they find only limited application and usefulness.

The long afterglow phosphorescent pigments are calcium and strontium sulphides and combinations of these. Again they must be prepared from pure chemicals, suitably activated with small amounts of metallic salts, treated with fluxes and calcined at high temperatures (1000 to 1200° C.). These pigments are very coarse and cannot be finely ground or thoroughly dispersed without loss of phosphorescence. In addition, they are quite unstable because of their ready decomposition by water. Traces of atmospheric moisture are sufficient to hydrolyze them with a complete loss of phosphorescence. The coarseness and lack of stability of these pigments has thus far prevented any large use in paper, paper coatings, or printing ink. For satisfactory results, such pigments



Zinc Oxide (400 Diam.)



Fluorescent Zinc and Cadmium Sulphide (400 Diam.)

FIG. 1

are fabricated in plastics or paints. Some printing applications have been made by resorting to silk screen printing, bronzing (dusting) printing and by reverse printing (black overprinting) on paint coated surfaces.

Properties of Fluorescent Zinc and Cadmium Sulphides

Fluorescent zinc sulphides and zinc and cadmium sulphides are the luminescent pigments that have found most use in printing inks, coated papers, and filled papers. Detailed discussion of properties is therefore limited to this group of materials.

The fluorescent property of these pigments is a function of their crystal structure and since they are relatively coarse, some care must be exercised in grinding or dispersing them so as not to destroy this crystal structure. With such care, however, the pigments can be ground on roller mills to make reasonably satisfactory printing inks, can be dispersed in paper coatings by mixing or colloid milling, and can be dispersed in paper furnishes in the beater. Figure 1 shows the comparative size of a fluorescent zinc and cadmium sulphide and a pigment grade zinc oxide, using photomicrographs at 400 diameters.

While satisfactory printing inks have been prepared from these fluorescent pigments for use in compression printing in many fabrications, it has been found desirable to resort to other printing processes. In the case of instrument dials and other pieces of equipment where markings and gradations are required, the silk screen printing method has been used with considerable success. In the printing of tables of data where a black background is desirable, the bronzing or dusting method of printing has been quite satisfactory. Again, in the printing of dials and similar items requiring fine gradations and divisions, as well as in the printing of tables of data, the method of overprinting has been used quite successfully. By this latter process, rather coarse pigments may be used by incorporating them in a paint-like coating which is applied to the paper, metal, paperboard, or other material to be printed and the overprinting is then done by conventional means using a black opaque printing ink.

Chemically, these pigments are quite stable, being unaffected by water, weak acids or alkalies, or exposure to strong sunlight and weathering. In the form of paints, they have been exposed to outdoor weathering for months and even years with little loss in fluorescence. Under certain conditions of exposure to sunlight, in the presence of moisture, and in certain vehicles, the pigments are subject to a photochemical darkening, sometimes termed light-darkening. Precautions must be taken to select suitable vehicles or other dispersing mediums so as to avoid such photochemical darkening.

The selection of a vehicle is important, not only from the standpoint of light-darkening, but also to obtain best fluorescent brightness and color. In general, the vehicle should be colorless and reasonably transparent to the exciting ultraviolet light. In this respect, solutions of some of the newer synthetic resins are superior to the older types of bodied oils. Methacrylate, polystyrene, vinyl chloride and vinyl acetate are most satisfactory to give films of high fluorescent brightness. Other resins, such as urea-formaldehyde or alkyd, or processed oils, may be used, though generally at some loss in luminescence. The combination of care in selection of a suitable vehicle and proper incorporation or dispersion of the pigment in the vehicle makes the successful preparation of fluorescent printing inks a matter for some test, trial, and development.

The fluorescent color is a direct function of the of pigment. A wide range of colors is available from a light blue (zinc sulphide) to a deep red (zinc and cadmium sulphide). The color is controlled by the ratio of zinc sulphide and cadmium sulphide used in the base pigment, by the amount and kind of activating metal used, and by the temperature of calcination. The spectra of these pigments are generally continuous bands of radiation and such bands are often narrow and the resulting color is quite saturated.

Daylight color is generally white or near white and does not at all correspond to the fluorescent color. Pigments containing large amounts of cadmium show some of the characteristic yellow color of cadmium sulphide.

The fluorescent brightness is partly a function of the dispersing medium and the degree of dispersion, but is principally a function of the pigment. In general, the green and yellow pigments show highest fluorescent brightness, comparable to the most brilliant of the organic dyes. The fluorescent brightness is controlled by the intensity of the exciting light used and the concentration of fluorescent pigment in the composition. By such control, brightness from 1 microlambert* or less to several thousand microlamberts or more, may be obtained. Since fluorescent compositions are most often used under conditions where the dark-adapted eye is being employed and its dark adaptation must be maintained, the brightness levels used range from 1 to 40 microlamberts.

Fluorescent inorganic pigments are not completely instantaneous in their response to excitation or in their cutoff when excitation ceases. In the practical application of the pigments, the lag in response to excitation is not a serious limitation, but in some cases, the afterglow or lag is objectionable. One specification requires the material to decay to 5% of its fluorescent brightness 0.5 second after excitation ceases. The maintenance of this property is again the function of the pigment and is controlled by the activating metals, calcination procedures, etc., used in its manufacture.

* The microlambert is 1-millionth part of a lambert. It is the brightness of a perfectly diffusing and reflecting surface when illuminated by a source of unit candlepower placed at a distance of 10 meters.

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2. Beggs, E. W., *Jour. of the Optical Soc.*, 33, No. 2: 61-70, (Feb. 1943).
3. Millson, H. E., "The Phenomenon of Fluorescence." Calco Technical Bull. No. 571, American Cyanamid Company.

Promotes Practice of Forestry

Among recent measures to promote forestry has been the organization of the Wisconsin Forest Industries Information Committee, with headquarters at Oshkosh, Wis. Its purpose is to encourage, promote and disseminate public information about industrial forestry operations. Folke Becker, president of the Rhinelander Paper Company, Rhinelander, Wis., is the chairman, and one of the members is F. E. Sensenbrenner, assistant secretary-treasurer of the Kimberly-Clark Corporation, Neenah, Wis. The secretary is H. S. Crosby of the Northern Hemlock and Hardwood Manufacturers Association. The Wisconsin Conservation Commission will cooperate with the group.

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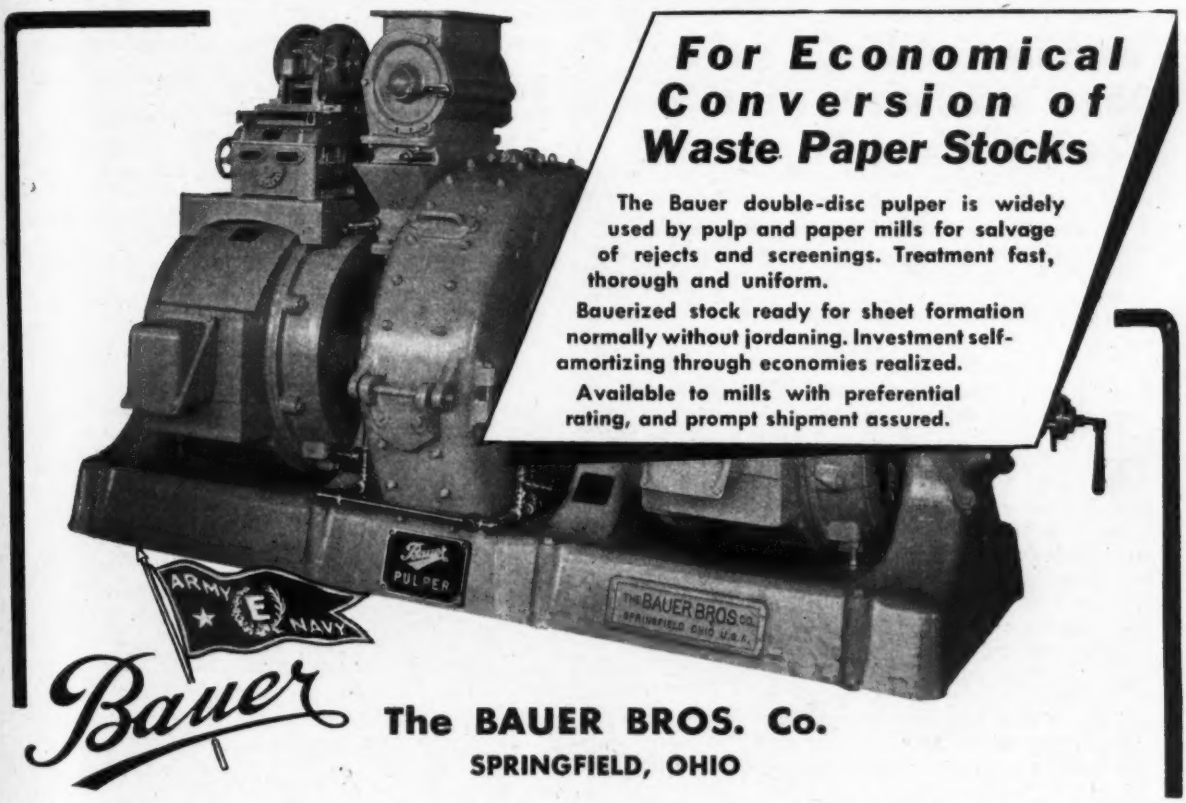

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New York Paper and Pulp Market Review

Demand For Paper Is Active With Production At High Level — Pulpwood Supply Situation Is Critical — Mills Still Need More Waste Paper — Cotton Rag Market Active — Scrap Bagging Slow.

Office of the PAPER TRADE JOURNAL.
Wednesday, March 1, 1944.

Wholesale orders for paper continue to reflect a heavy demand for most types. Concern about the future civilian supply of paper, based upon the critical supply situation of pulpwood, also appears in most of the reports received during the current week from many manufacturers' representatives, jobbers, and general paper merchants.

Sales, as measured by the index of wholesale paper distributors, compiled by the Department of Commerce, shows a yearly monthly average increase. Starting at 100 in 1942, the index rose to 150.7 in 1941, to 155.7 in 1942, and to 192.9 in 1943. While sales were rising, inventories began to decline in July, 1942, fell to a low of 94.6 in December, 1943, a decline of 28% below July, 1942. During the like period, sales rose 57.4 points or 29%. These figures, the Department states, indicate that the increase in sales was made at the cost of inventories.

The index of general business activity for the week ended February 19, declined to 145.5, from 147.1 for the preceding week, compared with 136.2 for the corresponding week last year. The index of paper board production was 148.6, compared with 149.9 for the previous week, and with 142.9 for the corresponding week last year.

Paper production for the week ended February 19 was estimated at 92.4%, compared with 89.0% for 1943, with 103.1% for 1942, with 90.4% for 1941, and with 86.8% for the corresponding week for 1940.

Paper board production for the week ended February 19 was 96.0%, compared with 91.0% for 1943, with 102.0% for 1942, with 80.0% for 1941, and with 69.0% for the coresponding week for 1940.

Sales to ultimate consumers, artists, etc., sales less than $1 and sales of specialty papers, will be removed from the regulation covering ceiling prices for fine papers and boards, the OPA announced. This is Amendment No. 8 to MPR-400. Sales of the above items, effective March 3, 1944, will be covered by the General Maximum Price Regulation.

Wood Pulp

Pulpwood consumption, estimated by the Department of Commerce, for the first 1944 quarter, based on WPB allocations of wood pulp, amounts to approximately 4,000,000 cords. Estimates of new receipts of pulpwood total 3,228,000 cords. From a practical point of view, the report points out, some mills with inventories less favorable, will be forced to shut down or reduce consumption before the estimated withdrawal of inventories of 819,000 cords takes place. This will result in a decline in wood pulp production, with a consequent decline in paper and paper board production.

Rags

Demand for new cotton cuttings is active, with mill buying taking about all the available supplies. The market is strong with ceiling prices firmly maintained.

Trading in old cotton rags is heavy. Roofing mills are absorbing all available supplies in the roofing grades of old rags.

Old Rope and Bagging

In connection with the fiber situation, the Department of Commerce states that imports of hard and soft fiber during 1943, with stockpiles, substitutes, and the American hemp program, will barely be sufficient to provide for all demands during 1944.

No important change in the old rope market has been reported during the current week.

Demand for scrap bagging is more limited at this date. Trading is reported slow. Prices continue nominal.

Old Waste Paper

Need for waste paper continues urgent, with many mills actively buying all available grades. Collections of waste paper in the current salvage campaigns is reported to indicate fair progress.

More than 90% of the 400 Naval activities in the U. S. gathered paper and turned it in for salvage, the Navy Department states. The only paper burned by the Navy is that containing secret, confidential and restricted information and is a negligible percentage of the amount used.

Twine

No important change in the twine market has been reported this week. Demand for such grades as are obtainable is active. Prices continue to be firmly maintained.

Penn. Salt Co. in New Office

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 28, 1944—The Pennsylvania Salt Manufacturing Company announces the removal of its New York office on February 1st to 40 West 40th street, New York 18, N. Y. The New York office is the headquarters of two of the company's sales districts, one headed by F. G. Rodenburgh and the other by C. A. McCloskey.

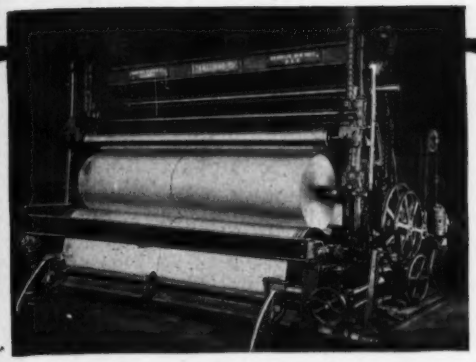
Col. C. S. Proctor Improves

BOSTON, Mass., February 28, 1944—Colonel Charles S. Proctor, head of the Proctor Paper Company of this city and Lowell, Mass., who has been seriously ill at St. John's Hospital, Lowell, is improving and expects to be at his home in about a week.

3,500,000 Tons Collected in Britain

WASHINGTON, D. C., March 1, 1944 — Approximately 3,500,000 long tons of waste paper have been collected in Great Britain since the war started, according to the Department of Commerce.

Collections were augmented during 1943 by special campaigns in which about 75,000,000 books were collected. Badly damaged books were converted to pulp.



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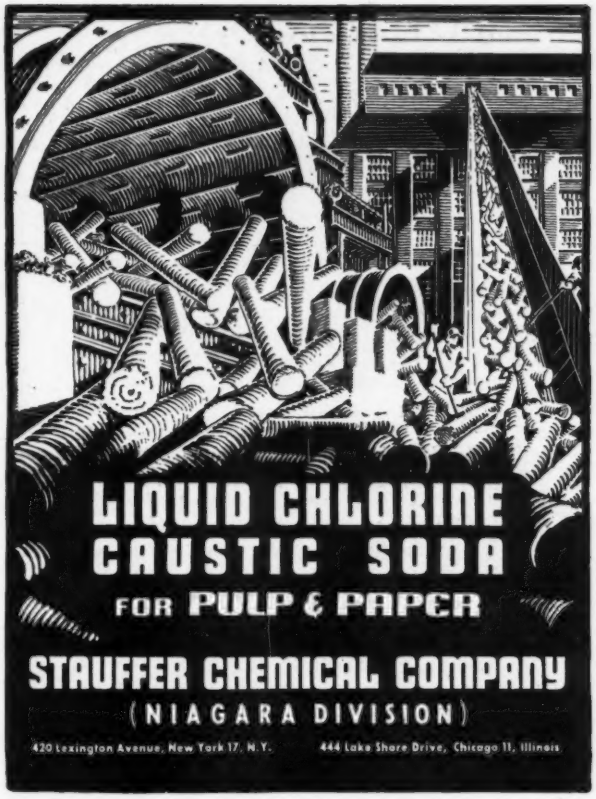

Carrying the theme of the 1944 American Red Cross War Fund Appeal, and symbolic of the true service of Red Cross men and women on the far-flung fronts of the world, this reproduction of the 1944 Red Cross poster depicts the Yank soldier, in full equipment, and at his side the representative of your Red Cross.

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Williamsburg, Pennsylvania
Charleston, South Carolina

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, March 1, 1944.

BLANC FIXE—Prices on blanc fixe continue to conform to prevailing quotations. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Demand is reported active with the supply situation satisfactory. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported casein, 9¼ cents per pound, f.o.b. source.

CAUSTIC SODA—Demand heavy. Shipping situation reported a little improved this week. Prices continue unchanged. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand active, with all allocation requirements met. Supply situation favorable. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market reports higher prices on some grades this week. "G" gum rosin is currently quoted at $4.43 per 100 pounds, in barrels, at Savannah. "FF" rosin is currently quoted at $4.35 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $4.70 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Demand is moderate for the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—The supply situation in soda ash is reported improved, under a heavy demand. Slight gain in shipments. Some imports have arrived. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Cash corn available for trade consumption continues limited and market is still tight on corn and corn products. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand moderate. Supply situation is reported satisfactory at this date. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $2.35 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR — Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported moderate. Domestic grades are currently quoted at from $16 to $21 per ton, at works.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	64.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet...	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.....	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....11.25		@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*48.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards....	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext.		
No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1..	$10.55@$12.75	$11.70@$14.25
No. 2..	9.65 " 11.75	10.80 " 13.25
No. 3..	9.20 " 11.25	10.35 " 12.56
No. 4..	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65@	$15.50
No. 2 Glossy Coated...	12.40 "	14.00
No. 3 Glossy Coated...	11.60 "	13.25
No. 4 Glossy Coated...	11.15 "	12.75
No. 1 Antique (watermarked)	10.25 "	11.75
No. 2 Offset.....	9.60 "	11.00
A Grade E. F.....	9.35 "	10.75
A Grade S. & S. C....	9.60 "	11.00
B Grade E. F.....	8.85 "	10.25
B Grade S. & S. C....	9.10 "	10.50
C Grade E. F.....	8.55 "	9.75
C Grade S. & S. C....	8.80 "	10.00
D Grade E. F.....	8.25 "	9.50
D Grade S. & S. C....	8.50 "	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight, Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Bl. Mitscherlich.....	81.00
Unbl. Mitscherlich ... 72.00 @	82.00
N. Bleached Sulphate.....	86.00
S. Bleached Sulphate.....	79.00
N. Semi-Bleached Sulphate..	84.00
S. Semi-Bleached Sulphate .	77.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate.....	63.50
Bl. Soda	72.00
Unbl. Soda	68.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area).....	7.50
West Coast (out area).....	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1.. ..	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall.....	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.00*

* OPA Maximum Prices.

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PRICE & PIERCE »»»»»»» ltd.

Wood Pulp & Paper Agents

60 East 42 Street
New York, N. Y.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	●	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	●	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	●	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	●	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1 — Repacked	3.80	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2 — Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.13	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Ksaft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	●	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.50	●	2.75
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.25	"	3.50
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	3.75	"	4.00
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	●	.04¾
Fancy Percales	.04¼	"	.05
New White No 1.	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	06¾
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06¾
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¾	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	●	—
Miscellaneous	3.30	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—